ORDER NO. ARD-8004036C

Service Manual

Cassette Deck

RS-M14

(Silver Face
Black Face)

Metal Tape Compatible Stereo Cassette Deck
with Peak-Hold FL Meters, Soft-Touch Controls and
Rewind Auto-Play Convenience

DOLBY SYSTEM

This is the Service Manual for the following areas.
- [D] ..... For all European areas except United Kingdom.
- [B] ..... For United Kingdom.
- [N] ..... For Asia, Latin America, Middle East and Africa areas.
- [A] ..... For Australia.
- [F] ..... For Asian PX.
- [J] ..... For European PX.

RS-M24 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback
Tape speed:	4.8 cm/s
Wow and flutter:	0.05% (WRMS), ±0.14% (DIN)
Frequency response:	Metal tape; 20 – 18,000 Hz 30 – 17,000 Hz (DIN)
	CrO_2/Fe-Cr tape; 20 – 18,000 Hz 30 – 16,000 Hz (DIN)
	Normal tape; 20 – 17,000 Hz 30 – 15,000 Hz (DIN)
Signal-to-noise ratio:	Dolby* NR in; 67 dB (above 5 kHz) Dolby NR out; 57 dB (signal level = max. recording level, Fe-Cr/CrO_2 type tape)
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape
Inputs:	MIC; sensitivity 0.25 mV, input impedance 25 kΩ over applicable microphone impedance 400Ω – 10 kΩ LINE; sensitivity 60 mV, input impedance 40 kΩ
Outputs:	LINE; output level 420 mV, output impedance 1.5 kΩ or less, load impedance 22 kΩ over HEADPHONE; output level 80 mV, load impedance 8Ω
Rec/Pb connection:	5P DIN type; input sensitivity 0.25 mV, impedance 5.3 kΩ output level 420 mV, impedance 5.2 kΩ
Bias frequency:	80 kHz
Motor:	Electrical DC governor motor
Heads:	2-head system; 1-MX head for record/playback 1-double-gap ferrite head for erasure
Power requirements:	AC; 110/125/220/240 V, 50-60 Hz
Power consumption:	15 W (for European areas and Australia) 13 W (for Asia, Latin America, Middle East, Africa areas and PX.)
Dimensions:	43.0 cm(W) × 11.9 cm(H) × 24.6 cm(D)
Weight:	4.3 kg

Specifications are subject to change without notice.

* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

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Matsushita Electric Industrial Co., Ltd.
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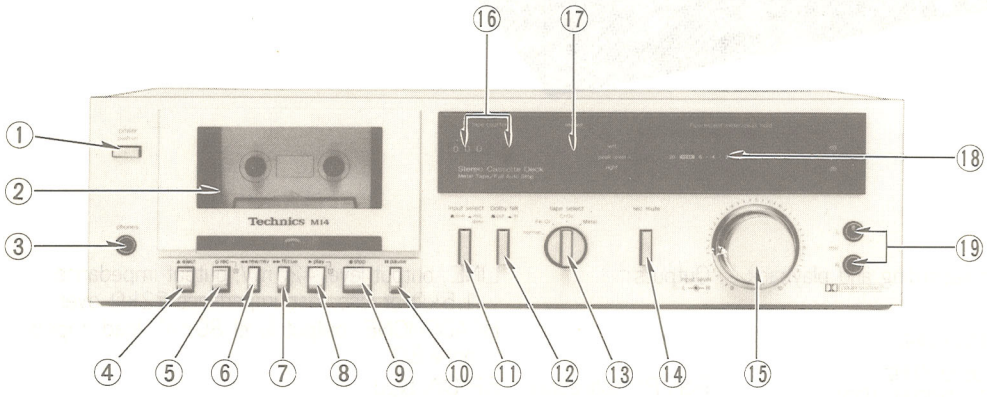
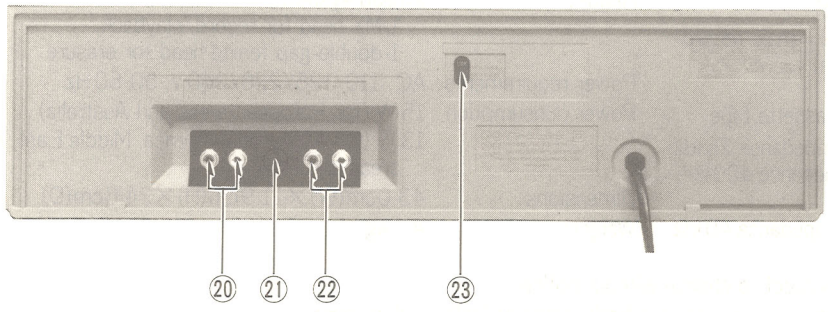
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

CONTENTS

LOCATION OF CONTROLS AND COMPONENTS





① Power switch
② Cassette holder
③ Headphones jack
④ Eject button
⑤ Record button
⑥ Rewind/review button
⑦ Fast forward/cue button
⑧ Playback button
⑨ Stop button
⑩ Pause button
⑪ Input selector
⑫ Dolby noise-reduction switch
⑬ Tape selector
(tape select-normal/Fe-Cr/CrO_2/metal)
⑭ Record muting button
⑮ Input level controls
⑯ Tape counter and reset button
⑰ Record indication lamp
⑱ FL (fluorescent level) meter
⑲ Microphone jacks
⑳ Line output jacks
㉑ Record/playback connection socket
㉒ Line input jacks
㉓ Voltage selector

DISASSEMBLY INSTRUCTIONS

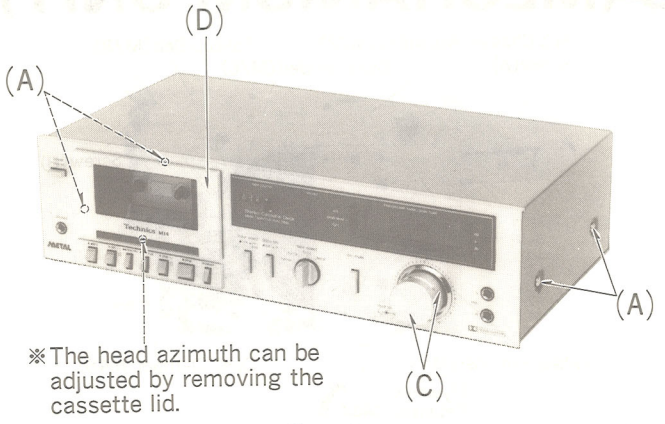


Fig. 3

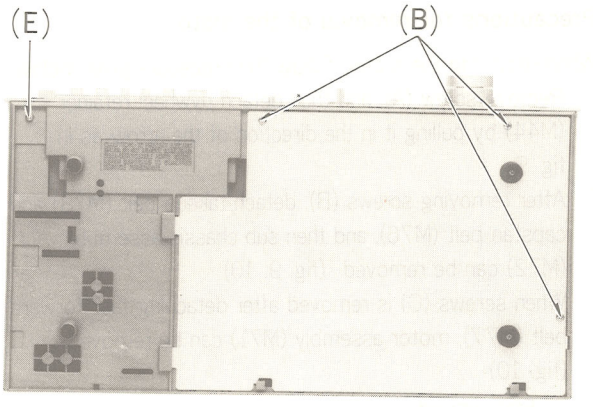


Fig. 4

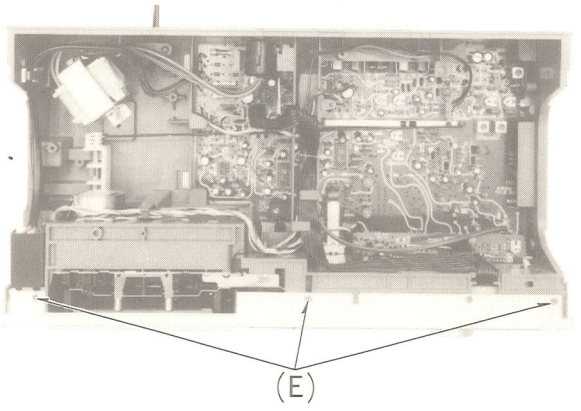


Fig. 5

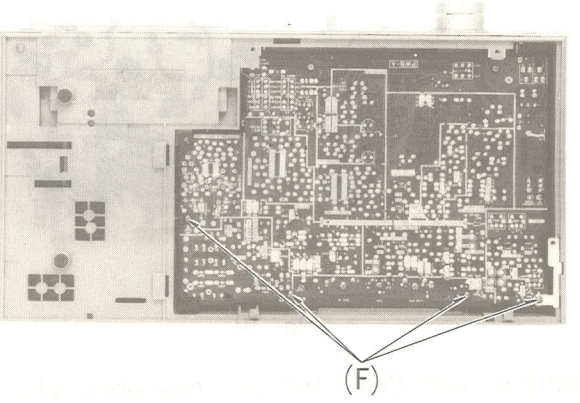


Fig. 6

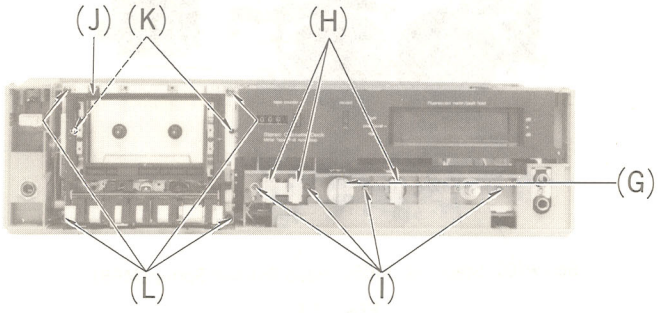


Fig. 7

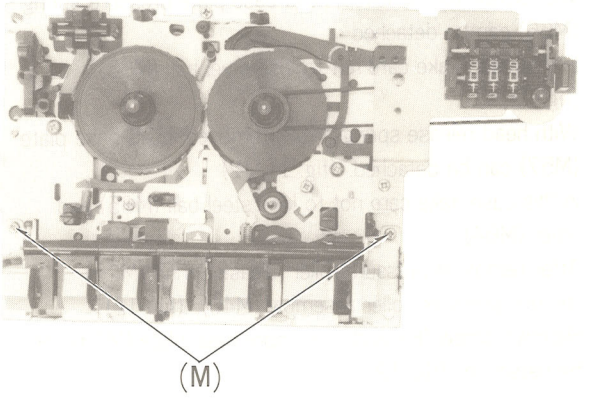


Fig. 8

Procedure	To remove —— .	Remove —— .	Shown in fig. —— .
1	Case cover	• 4 screws ..... (A)	3
2	Bottom cover	• 3 screws ..... (B)	4
3	Front panel	• 2 control knobs ..... (C) • Cassette lid ..... (D) • 4 screws ..... (E)	3 3 4, 5
4	Main circuit board	• 4 red screws ..... (F) • Tape select knob ..... (G) • 3 push buttons ..... (H) • 4 screws ..... (I)	6 7 7 7
4	Chassis cover assembly and mechanism unit	• Cassette holder ..... (J) • 2 black screws ..... (K) • 4 screws ..... (L)	7 7 7
5	Operation button assembly	• 2 screws ..... (M)	8

DISASSEMBLY NOTES (MECHANISM UNIT)

• Precautions for removal of the motor

When removing the motor, follow the procedure given below.

1. Remove screw (A), and then detach flywheel retainer (M44) by pulling it in the direction of the arrow as in fig. 9.
2. After removing screws (B), detach takeup belt (M78) and capstan belt (M76), and then sub chassis assembly (M72) can be removed. (fig. 9, 10)
3. When screws (C) is removed after detaching fast forward belt (M77), motor assembly (M71) can be removed. (fig. 10)

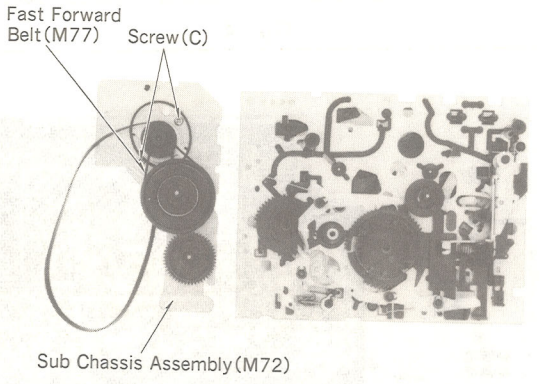


Fig. 10

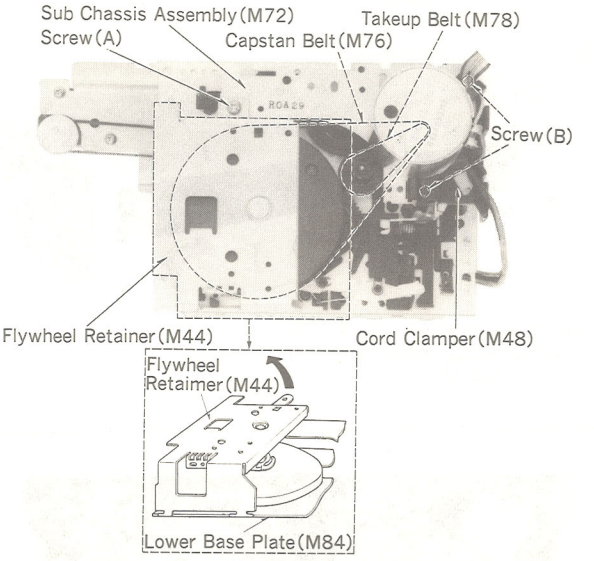


Fig. 9

• Head base plate (M57) and upper base plate (M83) removing procedure

1. With screw (D) removed, head base plate pressure spring (M66) can be detached.
   In this case, take care not to lose steel ball (M65). (fig. 11)
2. With head release spring (M68) removed, head base plate (M57) can be detached. (fig. 11, 12)
   In this case, take care not to lose steel ball (M65) and roller (M64).
3. After removing pressure roller release spring (M25), remove pressure roller assembly (M40). (fig. 12)
4. Remove screw (E), and then upper base plate (M83) can be detached. (fig. 12)

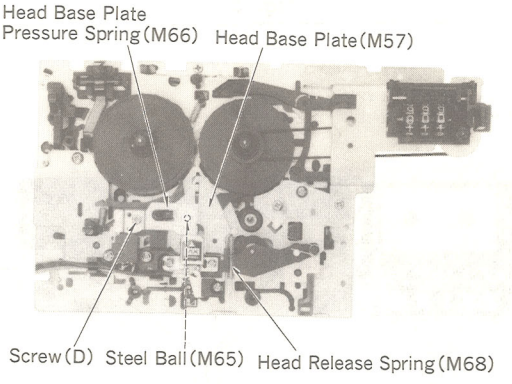


Fig. 11

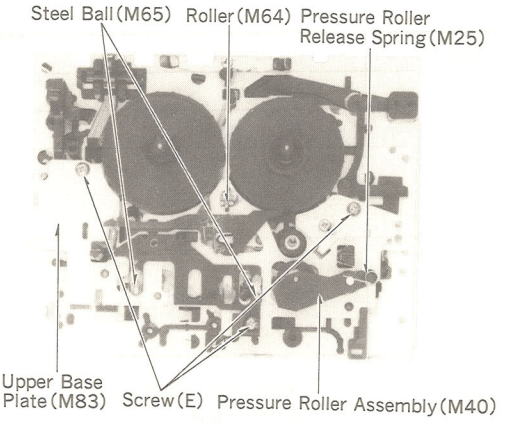


Fig. 12

MECHANISM SECTION

1. For repair, measurement or adjustment with the mechanism removed from the unit be sure to ground the lower base plate of the mechanism.
2. For grounding, connect a extension cord to the mechanism's lower base plate and the Lug terminal from main circuit board.
3. Without grounding, the amplifier does not operate properly.

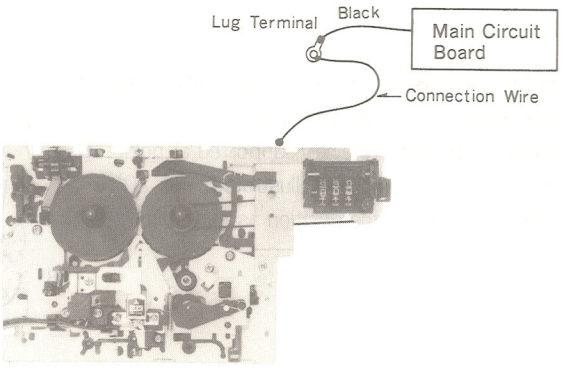


Fig. 13

ASSEMBLY INSTRUCTIONS

• Belt mounting

Check that each belt is free of damage or grease on the surface, after that, set the belt as illustrated, and mount it on the lower base plate (M84) after that, set the takeup belt (M78) on the fast forward connection pulley assembly (M82).

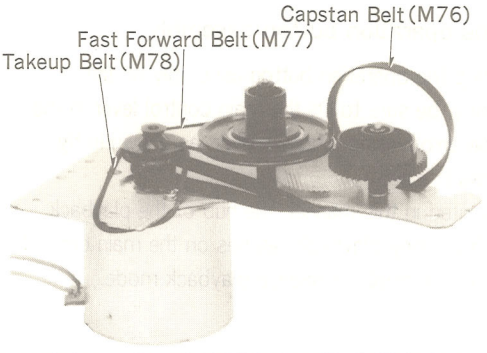


Fig. 14

• Positioning the takeup reel table assembly

When installing the takeup reel table assembly, be sure to mount the auto-stop friction hub (shown in fig. 16), as illustrated in fig. 15.
If the takeup reel table is positioned incorrectly at any place other than that shown in fig. 15, the auto-stop mechanism remains operative at all times.

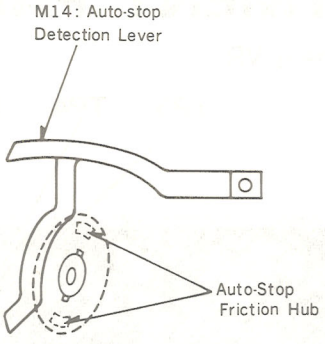


Fig. 15

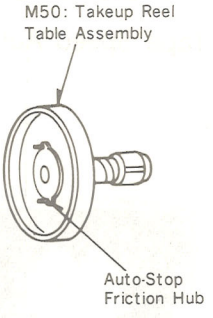


Fig. 16

• How to install the flywheel retainer

1. Insert the thrust retainer into the hole Ⓐ of the flywheel retainer as shown in fig. 17.
2. Hold the thrust retainer with the thumb as shown in fig. 18.

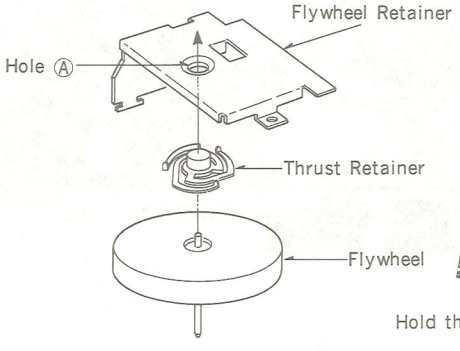


Fig. 17

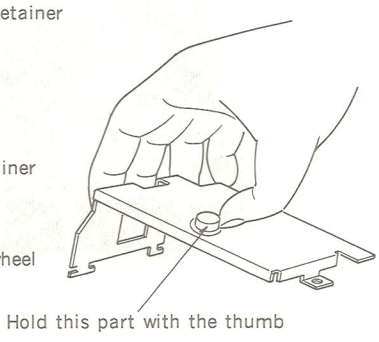


Fig. 18

3. Engage the parts Ⓑ and Ⓒ of the flywheel retainer with the lower base plate as shown in fig. 19.
4. Shift down the flywheel retainer, supported at points Ⓓ, in the direction of the arrow as illustrated. (fig. 20)
5. Attach the screw (A) in the position as shown in fig. 9.

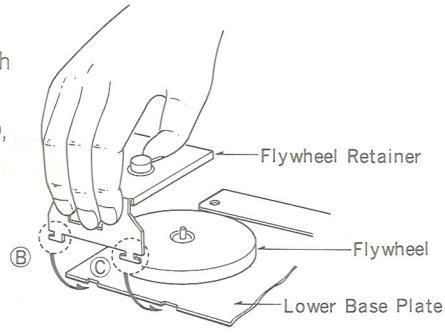


Fig. 19

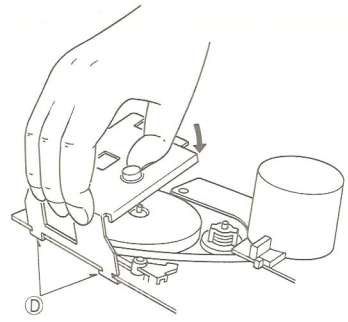


Fig. 20

- Mounting the operation button assembly

Before mounting the operation button assembly on the mechanism body, be sure to lift the main control lever in the direction of the arrow using a screwdriver, as shown in fig. 21, until it locks in place.
If it is not mounted in this manner, the hub of the playback button assembly during playback catches on the main control lever, making it impossible to release playback mode.

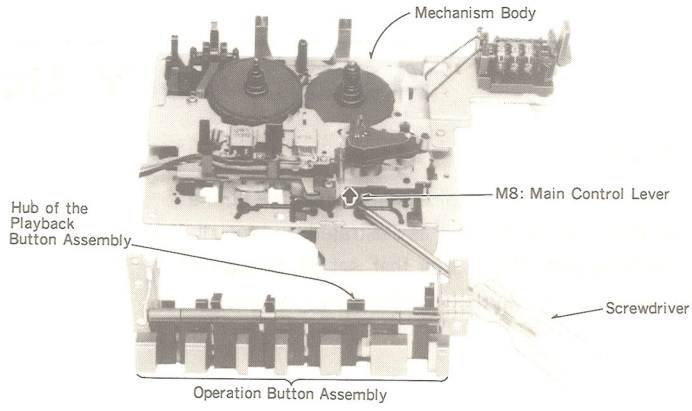


Fig. 21

ADJUSTMENT PARTS LOCATION

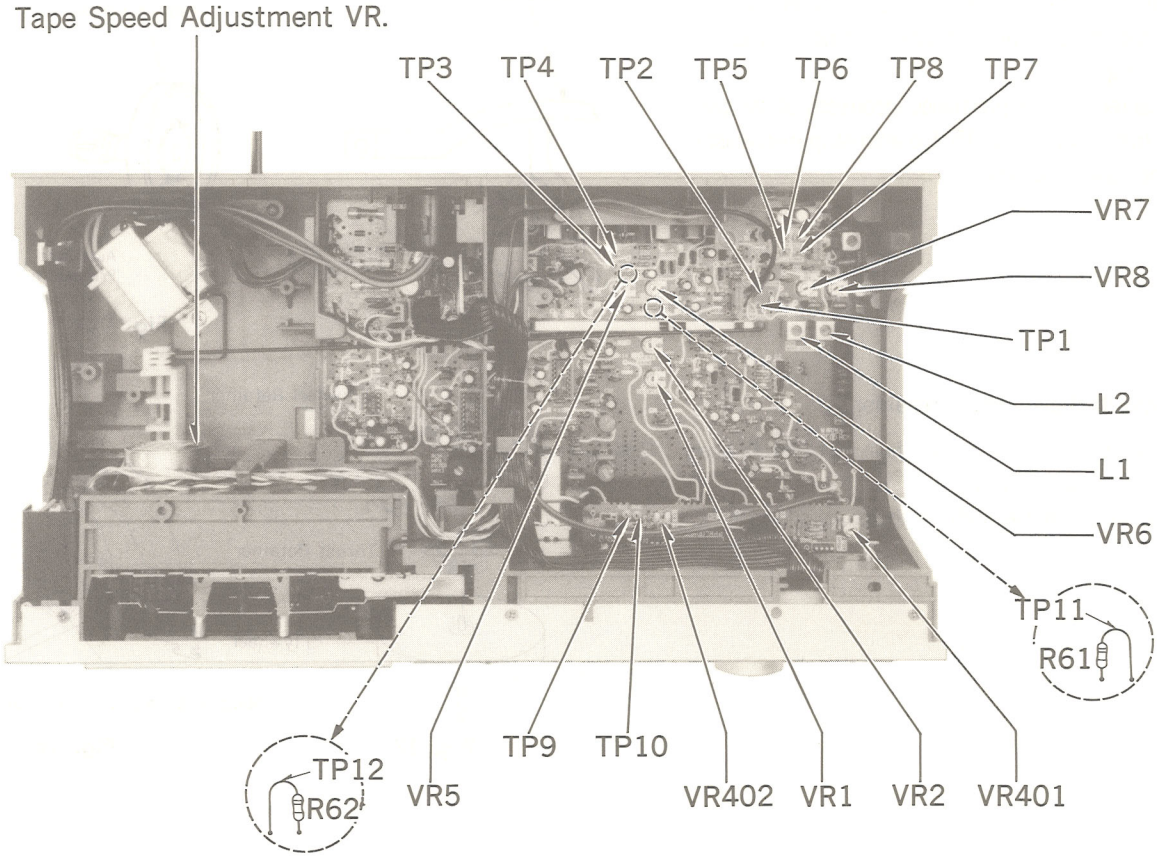
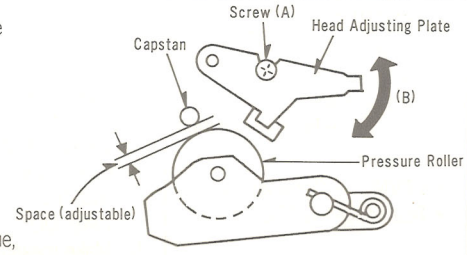
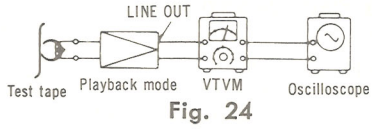
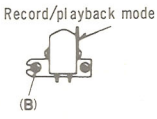
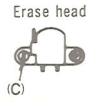
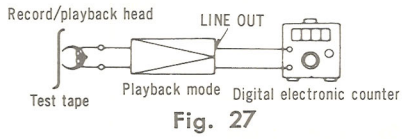


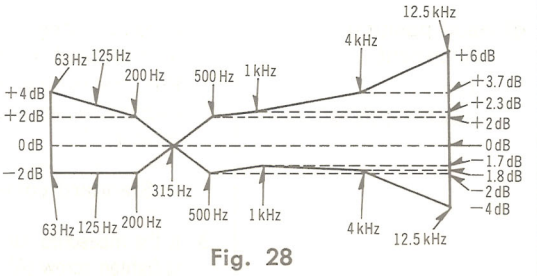
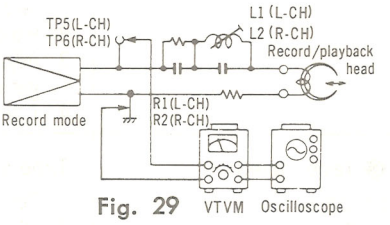
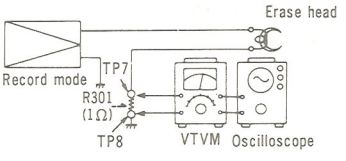
Fig. 22

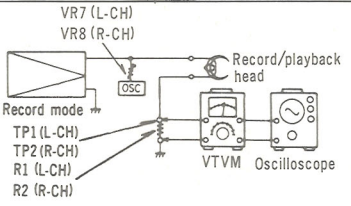
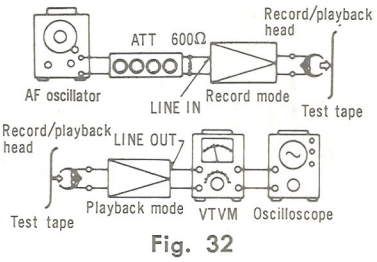
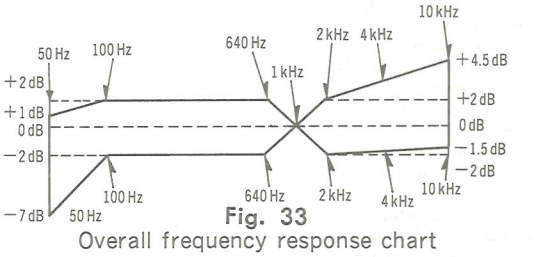
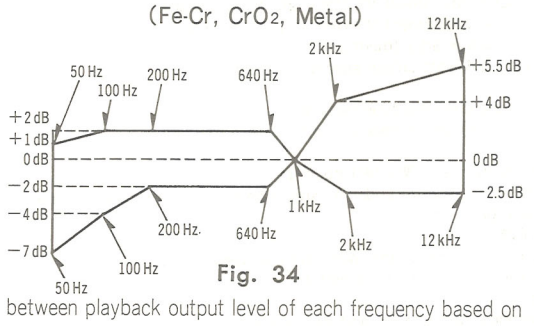
MEASUREMENT AND ADJUSTMENT METHODS

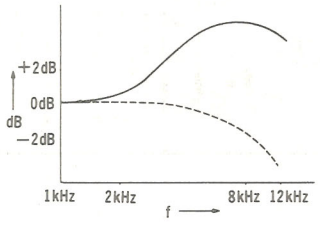
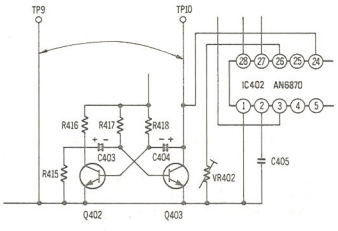
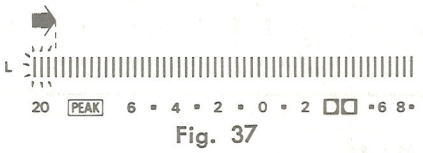
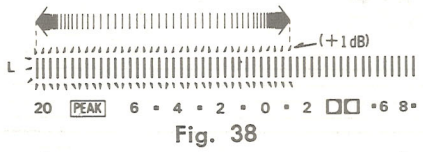
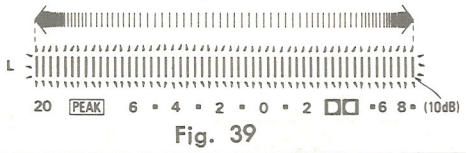
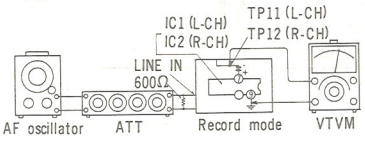
NOTES: Keep good condition, set lever switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F)
- Dolby NR switch: OUT
- Tape selector: Normal position
- Input selector: Line in
- Input level controls: Maximum

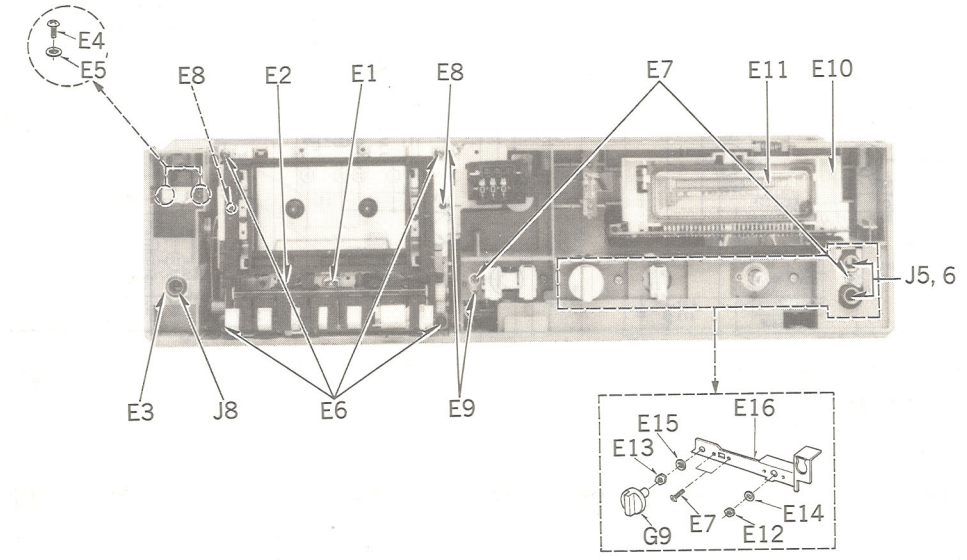
ITEM	MEASUREMENT & ADJUSTMENT
Ⓐ Head position adjustment Condition: * Playback and pause mode	(The head adjusting plate is provided to adjust the tape touch of the head in cue or review mode.) 1. Press the playback button and pause button. 2. Measure the space between the pinch roller and the capstan. Standard value: 0.5±0.3mm 3. If the measured value is not within the standard value, untighten screw (A), and slide the head adjusting plate in the direction of arrow (B) for adjustment.  Fig. 23
Ⓑ Head azimuth adjustment Condition: * Playback mode Equipment: * VTVM * Oscilloscope * Test tape (azimuth) ··· QZZCFM * Test tape (tape path viewer)	Record/playback head azimuth adjustment 1. Test equipment connection is shown in fig. 24. 2. Playback azimuth tape (QZZCFM 8kHz). 3. Adjust record/playback head angle adjustment screw (B) in fig. 25 so that output level at LINE OUT becomes maximum. 4. Measure both channels, and adjust levels for equal output. 5. After adjustment lock head adjustment screw with lacquer.  Fig. 24 Erase head azimuth adjustment 1. Test equipment connection is the same above but use the tape path viewer (QZZCRD) instead of test tape (QZZCFM). 2. Playback this tape. 3. Adjust screw (C) shown in fig. 26 so that the tape may not get curled or malformed by tape guide of the erase head. 4. After adjustment, lock head adjust screw with lacquer.  Fig. 25  Fig. 26
Ⓒ Tape speed Condition: * Playback mode Equipment: * Digital electronic counter or frequency counter * Test tape ··· QZZCWAT	Tape speed accuracy 1. Test equipment connection is shown in fig. 27. 2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter. 3. Measure this frequency. 4. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3{,}000}{3{,}000} \times 100\,(\%)$ where, f = measured value 5. Take measurement at middle section of tape. Standard value: ±1.5%  Fig. 27 Adjustment method 1. Playback the test tape (middle). 2. Adjust so that frequency becomes 3,000Hz. 3. Tape speed adjustment VR shown in fig. 22.

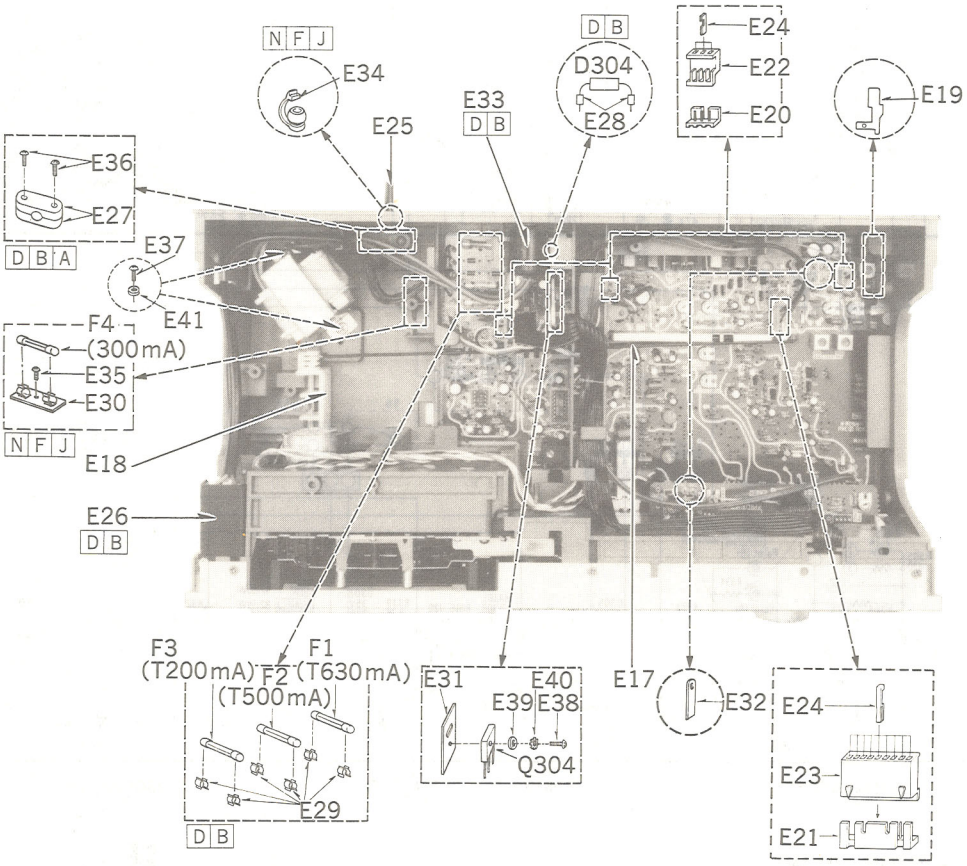
ITEM	MEASUREMENT & ADJUSTMENT
	Tape speed fluctuation Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows: $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3{,}000} \times 100\,(\%)$ f_1 = maximum value, f_2 = minimum value **Standard value: Less than 1%** **Note:** Please use non metal type screwdriver when you adjust tape speed accuracy on this unit.
Ⓓ Playback frequency response Condition: * Playback mode * Tape selector ··· Normal position Equipment: * VTVM * Oscilloscope * Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 24. 2. Place UNIT into playback mode. 3. Playback the frequency response test tape (QZZCFM). 4. Measure output level at 315 Hz, 12.5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz and 63 Hz, and compare each output level with the standard frequency 315 Hz, at LINE OUT. 5. Make measurement for both channels. 6. Make sure that the measured value is within the range specified in the frequency response chart. Playback frequency response chart  Fig. 28
Ⓔ Playback gain Condition: * Playback mode * Tape selector ··· Normal position Equipment: * VTVM * Oscilloscope * Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 24. 2. Playback standard recording level portion on test tape (QZZCFM 315 Hz), and using VTVM measure the output level at LINE OUT. 3. Make measurement for both channels. **Standard value: around 0.39 V** **Adjustment** 1. If measured value is not within standard, adjust VR1 (L-CH), VR2 (R-CH) (See fig. 22 on page 5). 2. After adjustment, check "Playback frequency response" again.
Ⓕ Bias leakage Condition: * Record mode * Input level controls ··· MAX * Tape selector ··· Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 29. 2. Place UNIT into record mode. 3. Adjust trap coil L1 (L-CH), L2 (R-CH) so that measured value on VTVM becomes minimum. 4. Take adjustment for both channels.  Fig. 29
Ⓖ Erase current Condition: * Record mode * Tape selector ··· Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 30. 2. Press the record and pause buttons. 3. Set the tape selector to metal position. 4. Read voltage on VTVM and calculate erase current by following formula: $\text{Erase current (A)} = \frac{\text{Voltage across both ends of R301}}{1\,(\Omega)}$ **Standard value: 155±15 mA (Metal position)** 5. If measured value is not within standard, adjust as follows. **Adjustment** 1. Open the point (A) and short the point (B) on the main circuit board in the wiring connection diagram (See page 10).  Fig. 30

ITEM	MEASUREMENT & ADJUSTMENT
	2. Make measurement for erase current. 3. Make sure that the measured value is within the erase current of 140 mA to 170 mA. 4. If it is beyond the value, carry out the following adjustments: • If the erase current is less than 140 mA, short the point (A). • If the erase current is more than 170 mA, open the points (A) and (B).
(H) Bias current Condition: * Record mode * Tape selector ··· Normal position ··· Fe-Cr position ··· CrO_2 position ··· Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 31. 2. Place UNIT into record mode, and tape selector to normal position. 3. Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$ **Standard value: around 410 μA (Normal position)**  Fig. 31 4. If measured value is not within standard, adjust VR7 (L-CH) and VR8 (R-CH) (See fig. 22 on page 5). 5. Set the tape selector to each position. 6. Make sure that the measured value is within standard. **Standard value: around 440 μA (Fe-Cr position), around 545 μA (CrO_2 position), around 800 μA (Metal position)**
(I) Overall gain Condition: * Record/playback mode * Input level controls ··· MAX * Standard input level; MIC ····· −72 ± 4 dB LINE IN ··· −24 ± 4 dB Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω) * Test tape (reference blank tape) ··· QZZCRA for Normal	1. Test equipment connection is shown in fig. 32. 2. Place UNIT into record mode, and tape selector to normal position. 3. Supply 1 kHz signal (−24 dB) from AF oscillator, through ATT to LINE IN. 4. Adjust ATT until monitor level at LINE OUT becomes 0.39 V. 5. Using test tape, make recording. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.39 V (−7 dB). 7. If measured value is not 0.39 V, adjust VR5 (L-CH), VR6 (R-CH) (See fig. 22 on page 5). 8. Repeat from step (2).  Fig. 32
(J) Overall frequency response Condition: * Record/playback mode * Tape selector ··· Normal position ··· Fe-Cr position ··· CrO_2 position ··· Metal position * Input level controls ··· MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω) * Test tape (reference blank tape) ··· QZZCRA for Normal ··· QZZCRY for Fe-Cr ··· QZZCRX for CrO_2 ··· QZZCRZ for Metal	**Note:** Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response). 1. Test equipment connection is shown in fig. 32. 2. Place the normal test tape (QZZCRA) in the cassette holder. 3. Place UNIT into record mode, and tape selector to normal position. 4. Supply 1 kHz signal from AF oscillator through ATT to LINE IN. 5. Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU). 6. At this time, LINE OUT level indicates 0.039 V. 7. Record each frequency 1 kHz, 50 Hz, 200 Hz, 4 kHz, 8 kHz and 10 kHz (12 kHz for Fe-Cr, CrO_2 and metal). Overall frequency response chart (Normal)  Fig. 33 Overall frequency response chart (Fe-Cr, CrO_2, Metal)  Fig. 34 8. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz.

ITEM	MEASUREMENT & ADJUSTMENT
	9. Make sure that the measured value is within the range specified in the overall frequency response chart (Shown in fig. 33). 10. Change test tape to Fe-Cr (QZZCRY), CrO_2 (QZZCRX) and metal (QZZCRZ). 11. Set the tape selector to each position. 12. Measure in the same manner from step (3) to step (8). 13. Make sure that the measured value is within the range specified in the overall frequency response chart for Fe-Cr, CrO_2 and metal tape (Shown in fig. 34). **Adjustment—Using bias current** 1. When the frequency response between the middle and high frequency range becomes higher than the standard value, as shown by the solid line in fig. 35 increase, refer to bias current adjustment. 2. When it becomes lower, as shown by dotted line, refer to bias current adjustment. **Note:** For the method of bias current measurement, refer to "Bias current adjustment" on page 8.  Fig. 35
K Fluorescent meter Condition: * Record mode * Input level controls ··· MAX * Tape selector ··· Normal position Equipment: * VTVM * AF oscillator * ATT * Resistor (600Ω)	1. Test equipment connection is shown in fig. 32. 2. As shown in fig. 36, connecting the base of Q402 and ground stops the oscillation of the astable multivibrator comprising Q402 and Q403. 3. Supply 1 kHz signal (−24 dB) to the LINE IN then press the record button. 4. Adjust the ATT so that the output level at LINE OUT becomes 0.39 V (The input level at this condition is termed the standard input level). 5. Adjustment at "−20 dB": A. Adjust the ATT so that the input level is −20 dB below standard recording level. B. Adjust VR401 so that the −20 dB segment lights up in the −20±0.8 dB range (L-CH only) (See fig. 37). 6. Adjustment at "0 dB": A. Adjust the ATT so that the output level at LINE OUT becomes 0.39 V. (The input level at this condition is termed the standard input level.) B. Adjust VR402 so that the +1 dB segment lights up in the 0±0.2 dB range of the standard input level (See fig. 38). 7. Repeat twice between steps (5) and (6) above. 8. Adjust ATT and check that all segments lights up when an input signal level is increased to 10 dB higher than the standard input level (See fig. 39).  Fig. 36  Fig. 37  Fig. 38  Fig. 39
L Dolby NR circuit Condition: * Record mode * Dolby NR switch ··· IN/OUT * Input level controls ··· MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω)	1. Test equipment connection is shown in fig. 40. 2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain −34.5 dB at TP11 (L-CH), TP12 (R-CH) (frequency 5 kHz). 3. Confirm that the value at IN position is 8 (±2.5) dB greater than the value at OUT position of Dolby NR switch.  Fig. 40

ELECTRICAL PARTS LOCATION





NOTE: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
	ELECTRICAL PARTS	
E1	QWY4122Z	Record/Playback Head
E2	QWY2138Z	Erase Head
E3	QNQ1070	Nut 12φ
E4	XSN3+8S	Screw ⊕3×8
E5	XWA3B	Washer
E6	XTN3+10B	Tapping Screw ⊕3×10
E7	XTN3+8B	Tapping Screw ⊕3×8
E8	XTN26+6B	Tapping Screw ⊕2.6×6
E9	QJT0015	Lug Terminal
E10	QKJ0406	FL Meter Holder
E11	QSIFL001F	FL Meter
E12	QNQ1039	Nut 9φ
E13	QNQ1004	Nut 8φ
E14	QWQ1133	Spring Washer 9φ
E15	QWQ2002	Spring Washer 8φ
E16	QMA3956	Volume Angle
E17	QBS1130	Recording Wire
E18	QML3664	Recording Lever
E19	QJC0034	Earth Plate
E20	QJP1921TN	3 Pin Post
E21	QJP1922TN	6 Pin Post
E22	QJS1921TN	3 Pin Socket
E23	QJS1922TN	6 Pin Socket
E24	QJT1054	Contact
E25 D ⚠	QFC1204M	AC Power Cord
※For all European areas except United Kingdom.		
B ⚠	QFC1205M	〃
※For United Kingdom.		
N F J ⚠	QFC1203M	〃
※For Asia, Latin America, Middle East, Africa areas and PX.		
A ⚠	QFC1208M	〃
※For Australia.		
E26 D B	QKJ0407	Insulation Plate
※For all European areas.		
E27 D B A	QTD1164	Cord Clamper
※For all European areas and Australia.		
E28 D B	QZE0003	Porcelain Tube
※For all European areas.		
E29 D B ⚠	QTF1054	Fuse Holder
※For all European areas.		
E30		
N F J ⚠	QTF1049	〃
※For Asia, Latin America, Middle East, Africa areas and PX.		
E31	QTH1118	Heat Sink
E32	QJT1041	Check Pin
E33 D B	QTWM0026	Rotary Switch Cover
※For all European areas.		
E34 N F J	QTD1129	Cord Bushing
※For Asia, Latin America, Middle East, Africa areas and PX.		
E35 N F J	XTN3+10B	Tapping Screw ⊕3×10
※For Asia, Latin America, Middle East, Africa areas and PX.		
E36 D B A	XTN3+16B	Tapping Screw ⊕3×16
※For all European areas and Australia.		
E37	XSN4+10	Screw ⊕4×10
E38	XSN26+8	Screw ⊕2.6×8
E39	XWA26B	Washer
E40	XWG26	〃
E41	XWA4B	〃

NOTES:

- D ····· For all European areas except United Kingdom.
- B ····· For United Kingdom.
- N ····· For Asia, Latin America, Middle East and Africa areas.
- A ····· For Australia.
- F ····· For Asian PX.
- J ····· For European PX.

RS-M14

SCHEMATIC DIAGRAM

Q1~Q4 2SD661(T, U) EQUALIZER
Q5, 6 2SD636(R, S) EQUALIZER SELECT
Q7, 8 2SD636(R, S) LINE IN MUTE
IC1, 2 NE646B DOLBY NR IC
Q9, 10 2SD636(R, S) RECORD MUTE
Q11, 12 2SD636(R, S) RECORD GAIN CONTROL (for Fe-Cr)
Q13, 14 2SD636H(R, S) RECORD AMP
Q15, 16 2SD965 LINE MUTE
Q17, 18 2SD636 CUE/REVIEW MUTE
Q19 2SB641 CUE/REVIEW MUTE
IC3 AN6552 HEADPHONES AMP

RECORD/PLAYBACK HEAD (L CH)
RECORD/PLAYBACK HEAD (R CH)
LINE IN J1 (LCH)
LINE IN J2 (RCH)
MIC IN J5 (LCH)
MIC IN J6 (RCH)
J7 RECORD/PLAYBACK CONNECTION SOCKET
LINE OUT J3
LINE OUT J4
HEAD. PHONE J8

ERASE HEAD

Q301 2SD592NC(R, S) BIAS OSC
Q302 2SD636(R, S) MUTING
Q303 2SB641(S, T) MUTING
Q304 2SC1864(R, S) REGULATOR
Q404 DB NAFJ 2SC1383(R, S) NAFJ 2SD592(R, S) REGULATOR

IC401 AN6552 METER AMP
Q401 2SD965 METER MUTE
Q402, 403 DB NAFJ 2SC945(P) NAFJ 2SD636(R, S) ASTABLE MULTIVIBRATOR
FL METER
IC402 AN6870 METER DRIVE IC

AC POWER
MOTOR
* For All European areas.

TERMINATIONS (SIDE VIEW)

Q15, 16
301, 401

Q304

Q1—14, 17—19
302, 303
402—404

E C B

※For Asia, Latin America, Middle East and Africa areas.
※For PX.

※For Australia.

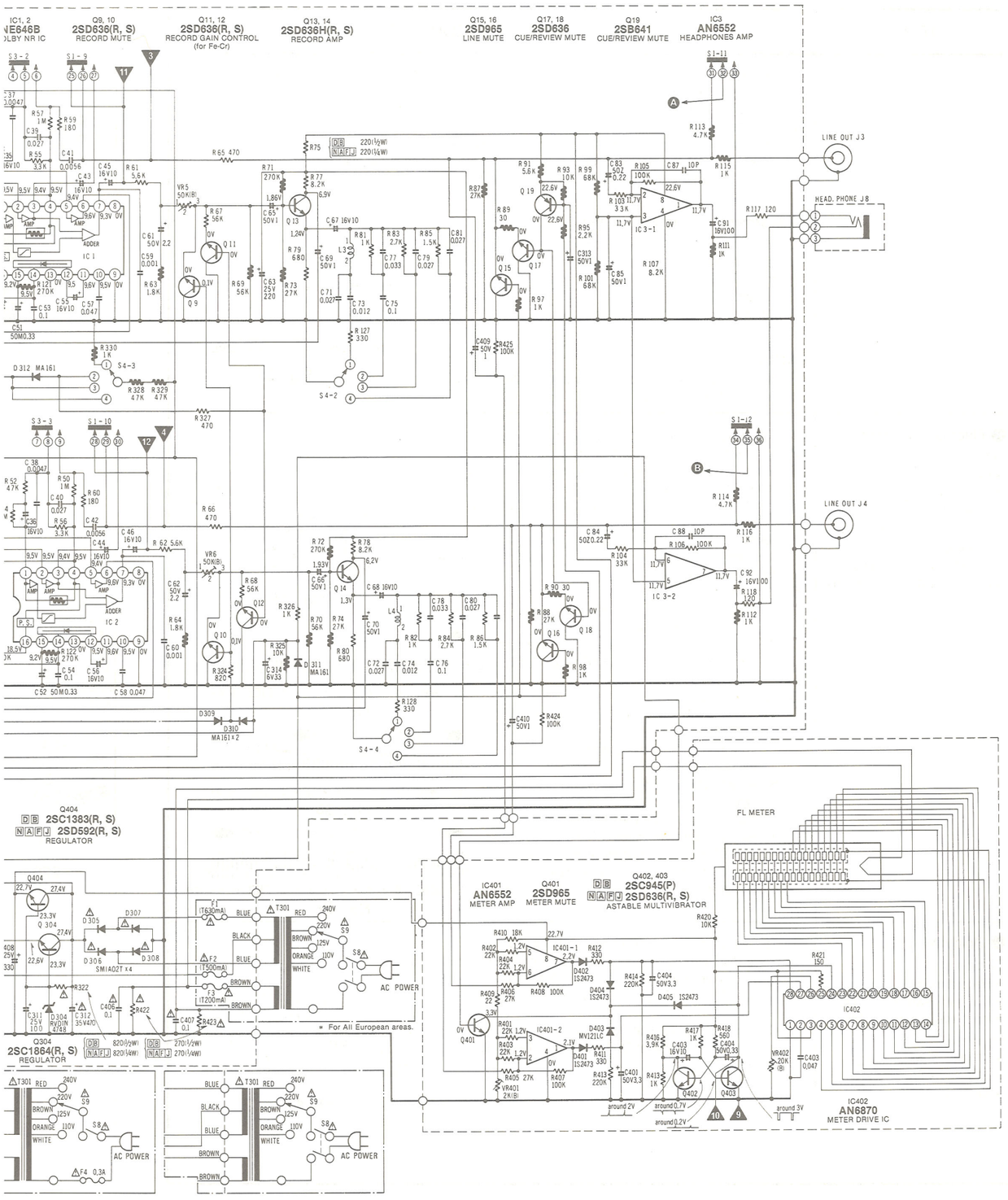
EQUIVA

IC402 AN687

IC3, 401 AN6552

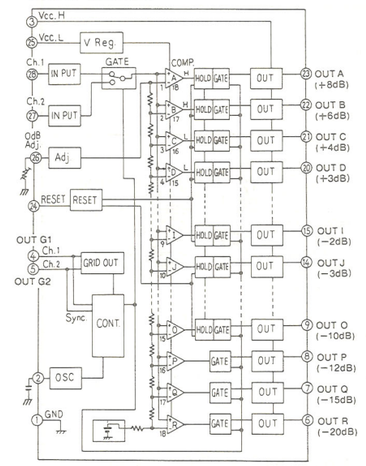
NOTES:

- S1-1—S1-14 ····· Record/playba
- S2-1—S2-4 ····· Input select sw
- S3-1—S3-4 ····· Dolby NR IN/C
- S4-1—S4-4 ····· Tape select sw
- S5 ····· Record muting
- S6 ····· Playback muti
- S7 ····· Cue and reviev
- S8 ····· Power ON/OFF
- S9 ····· AC voltage sel
- VR1, 2 ····· Playback gain
- VR3, 4 ····· Input level con
- VR5, 6 ····· Record gain ac
- VR7, 8 ····· Bias current ac
- VR401 ····· FL meter adjus
- VR402 ····· FL meter adjus
- L1, 2 ····· Bias leakage a
- Resistance are in ohms (Ω), 1/4 wat K=1,000Ω. Resistors indicated thickly show prin
- Capacity are in microfarads (μF) unl P=Pico-farads.
- The mark (▼) shows test point. e.
- All voltage values shown in circuitry volume control at minimum position. For measurement, use VTVM.
- △ indicates that only parts specifiec
- [D] ····· For all European areas except
- [B] ····· For United Kingdom.
- [N] ····· For Asia, Latin America, Midd
- [A] ····· For Australia.
- [F] ····· For Asian PX.
- [J] ····· For European PX.

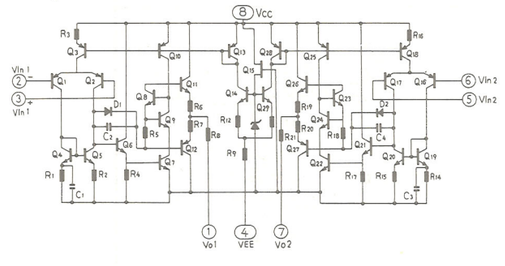


EQUIVALENT CIRCUIT

IC402 AN6870



IC3, 401 AN6552



NOTES:

- S1-1 – S1-14 ····· Record/playback select switch (shown in playback position).
- S2-1 – S2-4 ····· Input select switch (shown in LINE position).
- S3-1 – S3-4 ····· Dolby NR IN/OUT select switch (shown in OUT position).
- S4-1 – S4-4 ····· Tape select switch (1 ··· Normal, 2 ··· Fe-Cr, 3 ··· CrO_2, 4 ··· Metal).
- S5 ····· Record muting switch (shown in OFF position).
- S6 ····· Playback muting switch (close at playback or record mode).
- S7 ····· Cue and review muting switch (close at cue/review mode).
- S8 ····· Power ON/OFF switch (shown in OFF position).
- S9 ····· AC voltage select switch.
- VR1, 2 ····· Playback gain adjustment VR.
- VR3, 4 ····· Input level control.
- VR5, 6 ····· Record gain adjustment VR.
- VR7, 8 ····· Bias current adjustment VR.
- VR401 ····· FL meter adjustment VR (for −20 dB indication).
- VR402 ····· FL meter adjustment VR (for 0 dB indication).
- L1, 2 ····· Bias leakage adjustment coil.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  K = 1,000 Ω.
  Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise.
  P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position.
  For measurement, use VTVM.
- △ indicates that only parts specified by the manufacturer used for safety.
- [D] ····· For all European areas except United Kingdom.
- [B] ····· For United Kingdom.
- [N] ····· For Asia, Latin America, Middle East and Africa areas.
- [A] ····· For Australia.
- [F] ····· For Asian PX.
- [J] ····· For European PX.

NOTES: RESISTORS
ERD ··· Carbon
ERG ··· Metal-oxide
ERO ··· Metal-film
ERX ··· Metal-film
ERQ ··· Fuse type metallic
ERC ··· Solid
ERF ···· Cement

CAPACITORS
ECG□ ····· Ceramic
ECK□ ····· Ceramic
ECQ□ ····· Ceramic
ECF□ ····· Ceramic
ECQM ····· Polyester film
ECQE ····· Polyester film
ECQF ····· Polypropylene
ECE□ ····· Electrolytic
ECE□N ··· Non polar electrolytic
ECQS ····· Polystyrene
ECS□ ····· Tantalum

NOTE: △ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.
RESISTORS	
R1, 2	ERD25FJ100
R3, 4	ERD25FJ682
R5, 6	ERD25TJ104
R7, 8	ERD25FJ101
R9, 10	ERD25TJ154
R11, 12	ERD25FJ101
R13, 14	ERD25FJ471
R15, 16	ERD25TJ224
R17, 18	ERD25FJ822
R19, 20	ERD25TJ224
R21, 22, 23, 24	ERD25FJ822
R29, 30	ERD25FJ102
R31, 32	ERD25FJ472
R33, 34	ERD25FJ562
R41, 42 DB	ERD25FJ392
※For all European areas. NAFJ	ERD25FJ222
※For Asia, Latin,America, Middle East, Africa areas, Australia and PX. R43 DB	ERQ14AJ270
※For all European areas. NAFJ	ERD25FJ120
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R45 NAFJ	ERD25FJ150
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R47, 48, 49, 50	ERD25FJ102
R51, 52	ERD25TJ473
R53, 54	ERD25TJ105
R55, 56	ERD25FJ332
R57, 58	ERD25TJ105
R59, 60	ERD25FJ181
R61, 62	ERD25FJ562
R65, 66	ERD25FJ471
R67, 68	ERD25TJ563
R75 DB ※For all European areas.	ERG12ANJ221
NAFJ ※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R77, 78	ERD25FJ221
R79, 80	ERD25FJ822
R81, 82	ERD25FJ681
R83, 84	ERD25FJ102
R85, 86	ERD25FJ272
R103, 104	ERD25FJ152
R105, 106	ERD25TJ333
R117, 118	ERD25TJ104
R125, 126	ERD25FJ121
R127, 128	ERD25TJ273
R301	ERD25FJ331
R304	ERD25FJ1R0
R305	ERD25FJ272
R306, 307	ERD25FJ471
R308 DB	ERD25FJ122
※For all European areas. NAFJ	ERG12ANJ181
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R309 DB	ERD25FJ181
※For all European areas. NAFJ	ERG12ANJ221
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R310	ERD25FJ221
R311	ERD25FJ100
R313	ERD25FJ222
R316 DB	ERD25TJ224
※For all European areas. NAFJ	ERQ14AJ121
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R317	ERD25FJ121
R318	ERD25FJ562
R319	ERD25FJ222
R321 DB ※For all European areas.	ERD25FJ272
NAFJ ※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R322	ERQ12HJ470
DB △ ※For all European areas. NAFJ △ ※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R324	ERG12ANJ820
	ERD25FJ821
R326	ERD25FJ102
R327	ERD25FJ471
R331	ERD25FJ102
R333 DB ※For all European areas. NAFJ	ERD50FJ560
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R334 DB	ERG12ANJ101
※For all European areas. NAFJ	ERD50FJ101
※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R335 DB	ERD25FJ101
※For all European areas.	ERD50FJ470
R401, 402, 403, 404	ERD25TJ223
R405, 406	ERD25TJ273
R407, 408	ERD25TJ104
R409	ERD25FJ220
R410	ERD25TJ183
R411, 412	ERD25FJ331
R413, 414	ERD25TJ224
R415	ERD25FJ102
R416	ERD25FJ392
R417	ERD25TJ105
R418	ERD25TJ564
R420	ERD25TJ103
R421 DB ※For all European areas.	ERQ14AJ151
NAFJ ※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R422, 423	ERD25FJ151
DB △ ※For all European areas.	ERD50FJ271
NAFJ △ ※For Asia, Latin America, Middle East, Africa areas, Australia and PX. R425, 426	ERD25FJ271
	ERD25TJ104
VARIABLE RESISTORS	
VR1, 2	EVNK4AA00B24
VR3, 4	QVKDM80RA24
VR5, 6	EVNK4AA00B54
VR7, 8	EVNK4AA00B15
VR401	EVNK4AA00B23
VR402	EVNK4AA00B24
CAPACITORS	
C1, 2	ECCD1H331K
C3, 4	ECEA16M10R
C5, 6	ECEA1ES470
C7, 8	ECCD1H820KY
C9, 10	ECFDD102KVY
C11, 12	ECEA1CS330
C13, 14	ECFDD153KXY
C15, 16	ECKD1H681KBY
C17, 18	ECQP1152JZ
C19, 20	ECFDD562KVY
C21, 22	ECFDD102KVY
C23, 24	ECEA1CS330
C25, 26	ECEA1JS4R7
C27, 28	ECFDD222KVY
C29, 30	ECFDD123KXY
C31, 32	ECEA50MR33R
C33, 34, 35, 36	ECEA1HS100
C37, 38	ECQM1H472JZ
C39, 40	ECQM1H273JZ
C41, 42	ECQM1H562JZ
C43, 44, 45, 46	ECEA1HS100

SPECIFICATIONS

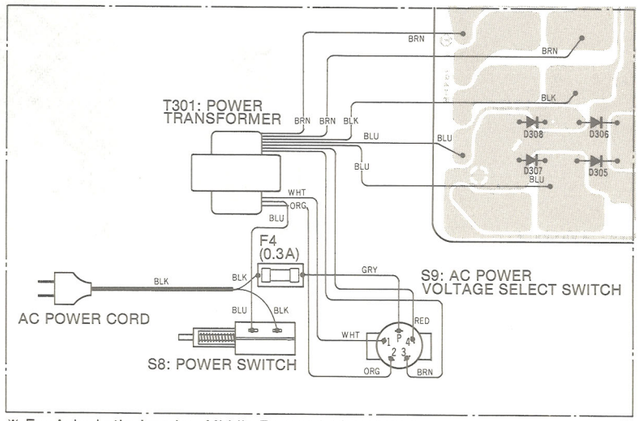
* Input level controls ··· MAX

Playback S/N ratio Test tape ··· QZZCFM	Greater than 45 dB (without NAB filter)
Overall distortion Test tape ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRY for Fe-Cr ··· QZZCRZ for Metal	Less than 4 %
Overall S/N ratio Test tape ··· QZZCRA	Greater than 43 dB (without NAB filter)

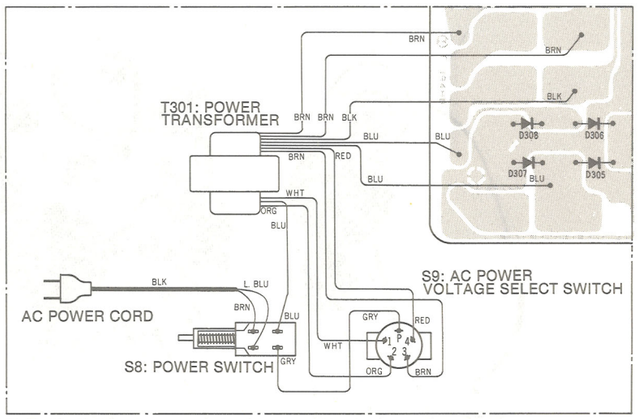
WIRING CONNECTION DIAGRAM AND CIRCUIT BOARD

Ref. No.	Part No.	Ref. No.	Part No.
C47, 48	ECEA1AS101	**TRANSISTORS**	
C50	ECEA1ES470		
C51, 52	ECEA50MR33R	Q1, 2, 3, 4	2SD661
C53, 54	ECFDD104KXY	Q5, 6, 7, 8, 9, 10, 11, 12	
C55, 56	ECEA1HS100		2SD636
C57, 58	ECFDD473KXY	Q13, 14	2SD636
C59, 60	ECKD1H102KB	Q15, 16	2SD965
C61, 62	ECEA2AS2R2	Q17, 18	2SD636
C63	ECEA2ES221	Q19	2SB641
		Q301	2SD592NCS
C65, 66	ECEA2AS010	Q302	2SD636
C67, 68	ECEA1HS100	Q303	2SB641
C69, 70	ECEA2AS010	Q304	2SC1846
C71, 72	ECQM1H273JZ		
C73, 74	ECFDD123KXY	Q401	2SD965
C75, 76	ECQM1H104KZ	Q402, 403	
C77, 78	ECFDD333KXY	DB	2SC945
C79, 80, 81, 82		※For all European areas.	
	ECFDD273KXY	NAFJ	2SD636
C83, 84	ECEA50ZR22	※For Asia, Latin America, Middle East, Africa areas, Australia and PX.	
C85	ECEA2AS010		
C87, 88	ECCD1H100KC	Q404 DB	2SC1383
C91, 92	ECEA1ES101	※For all European areas.	
C93, 94	ECCD1H101K	NAFJ	2SD592NCS
C301	ECQP1183JZ	※For Asia, Latin America, Middle East, Africa areas, Australia and PX.	
C302	ECFDD153KXY		
C303	ECEA1ES101		
C304	ECFDD822KYY	**DIODES**	
C305	ECEA1HS470		
C306	ECEA2AS2R2	D301, 302, 303	
C307	ECEA1VS221		MA161
		D304	RVD1N4748
C308	ECEA1CS102	D305, 306, 307, 308	
C309	ECEA1VS102	△	SM112
C310	ECFDD103KYY	D309, 310, 311, 312	
C311	ECEA1ES101		MA161
C312 △	ECEA1ES101	D313	TLR205
C313	ECEA2AS010	D314, 401, 402	
C314	ECEA1CS330		MA161
C401, 402	ECEA2AS3R3	D403	MV121
C403	ECEA1HS100	D404, 405	MA161
C404	ECEA50ZR33		
C405	ECFDD473KXY	**INTEGRATED CIRCUITS**	
C406, 407			
△	ECFDD104KXY	IC1, 2	NE646B
C408	ECEA1ES331	IC3, 401	AN6552
C409, 410	ECEA2AS010	IC402	AN6870

Ref. No.	Part No.	Part Name & Description
	TRANSFORMER	
T301		
DB △	QLPD45EL	Power Transformer
※For all European areas.		
NAFJ △	QLPN55EL	〃
※For Asia, Latin America, Middle East, Africa areas, Australia and PX.		
	COILS	
L1, 2	QLQC0331	Bias Trap Coil
L3, 4	QLQX0332K	Peaking Coil
L5, 6	QLM9Z7	MPX Filter
L301	QLB0198K	Bias Oscillation Coil
	SWITCHES	
S1	QSSE203	Slide Switch (Record/Playback Selector)
S2	QSW4209T	Push Switch (LINE IN/MIC Selector)
S3	QSW4209T	Push Switch (Dolby ON/OFF)
S4	QSR4403A	Rotary Switch (Tape Selector)
S5	QSW2103A	Push Switch (Record Muting ON/OFF)
S6	QSB0251J	Leaf Switch (Playback Muting Switch)
S7	QSB0251J	Leaf Switch (Fast Wind Muting Switch)
S8 DBA △	QSW2214	Push Switch (Power ON/OFF)
※For all European areas and Australia.		
NFJ	QSW1115AZ	〃
※For Asia, Latin America, Middle East, Africa areas and PX.		
S9 △	QSR1407H	Rotary Switch (AC Power Voltage Selector)
	FUSES	
F1 DB △	XBAQ0008	Fuse (T 630mA)
※For all European areas.		
F2 DB △	XBAQ050026	Fuse (T 500mA)
※For all European areas.		
F3 DB △	XBAQ0013	Fuse (T 200mA)
※For all European areas.		
F4 NFJ △	XBA2E03NR5	Fuse (300mA)
※For Asia, Latin America, Middle East, Africa areas and PX.		
	JACKS	
J1, 2, 3, 4, 7	QEJ5002S	Line IN/OUT and Record/Playback Connection Socket Jack Assembly
J5, 6	QJA0257H	Microphone Jack
J8	QJA0249C	Headphones Jack



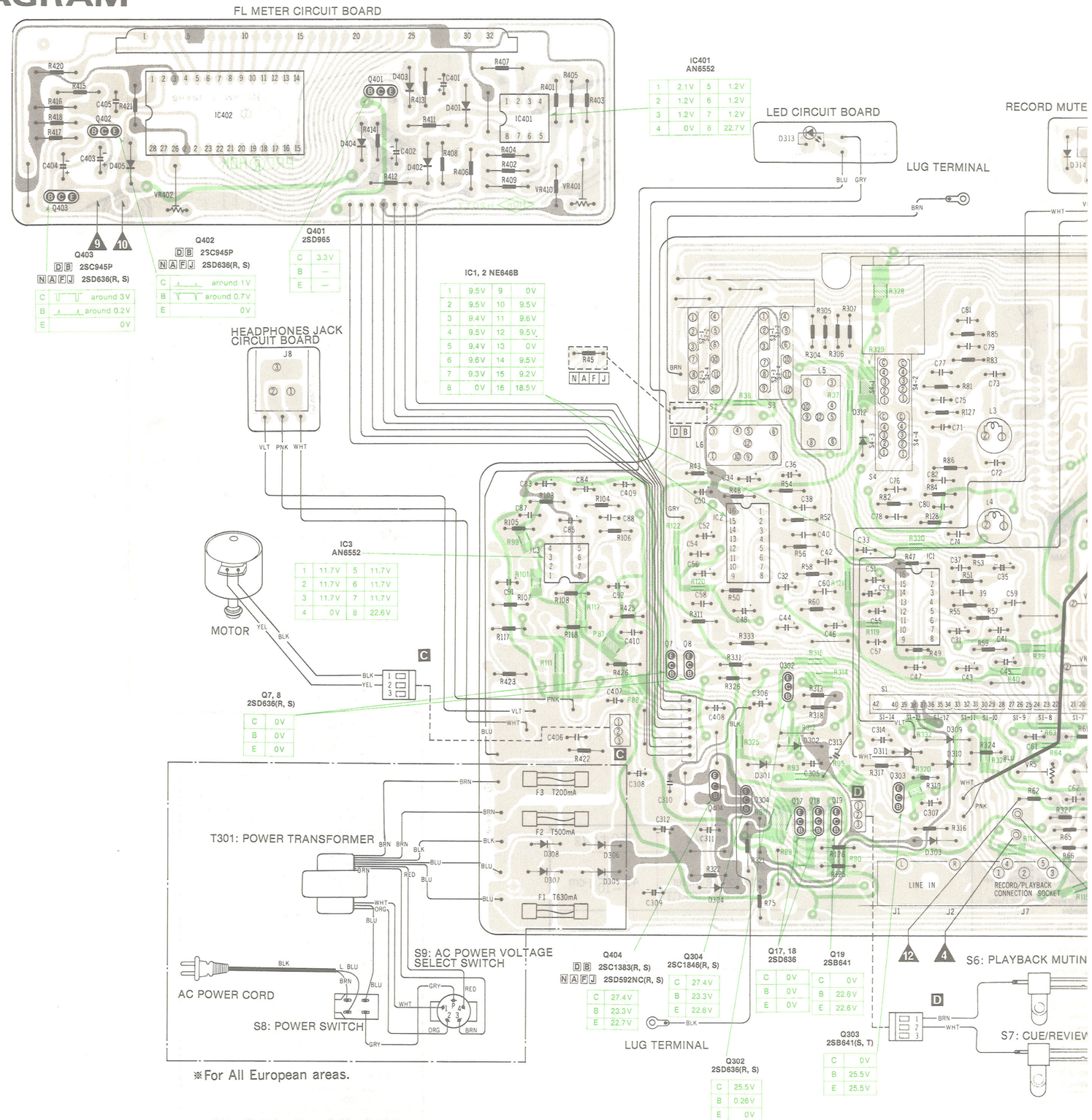
※ For Asia, Latin America, Middle East and Africa areas.
※ For PX.



※ For Australia

NOTES:

- The circuit shown in ▒ on the conductor is +B (bias) circuit.
- The circuit shown in ▒ on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in ▒ on the conductor indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ▭ are DC voltage between the ground and electrical parts.
- The voltage indicates are measured during record mode.



※For All European areas.

DIAGRAM

FL METER CIRCUIT BOARD

IC401
AN6552

1	2.1V	5	1.2V
2	1.2V	6	1.2V
3	1.2V	7	1.2V
4	0V	8	22.7V

LED CIRCUIT BOARD

RECORD MUTE CIRCUIT BOARD

LUG TERMINAL

MAIN CIRCUIT BOARD

Q5, 6
2SD636 (R, S)

C	0V
B	0V
E	0V

Q401
2SD965

C	3.3V
B	—
E	—

Q403
D B 2SC945P
N A F J 2SD636(R, S)

C	around 3V
B	around 0.2V
E	0V

Q402
D B 2SC945P
N A F J 2SD636(R, S)

C	around 1V
B	around 0.7V
E	0V

IC1, 2 NE646B

1	9.5V	9	0V
2	9.5V	10	9.5V
3	9.4V	11	9.6V
4	9.5V	12	9.5V
5	9.4V	13	0V
6	9.6V	14	9.5V
7	9.3V	15	9.2V
8	0V	16	18.5V

HEADPHONES JACK CIRCUIT BOARD

IC3
AN6552

1	11.7V	5	11.7V
2	11.7V	6	11.7V
3	11.7V	7	11.7V
4	0V	8	22.6V

MOTOR

Q7, 8
2SD636 (R, S)

C	0V
B	0V
E	0V

T301: POWER TRANSFORMER

F3 T200mA
F2 T500mA
F1 T630mA

S9: AC POWER VOLTAGE SELECT SWITCH

AC POWER CORD

S8: POWER SWITCH

※For All European areas.

Q404
D B 2SC1383(R, S)
N A F J 2SD592NC(R, S)

C	27.4V
B	23.3V
E	22.7V

Q304
2SC1846(R, S)

C	27.4V
B	23.3V
E	22.6V

LUG TERMINAL

Q17, 18
2SD636

C	0V
B	0V
E	0V

Q19
2SB641

C	0V
B	22.6V
E	22.6V

Q302
2SD636(R, S)

C	25.5V
B	0.26V
E	0V

Q303
2SB641(S, T)

C	0V
B	25.5V
E	25.5V

S6: PLAYBACK MUTING SWITCH

S7: CUE/REVIEW SWITCH

Q9, 10
2SD626(R, S)

C	0V
B	0.1V
E	0V

Q11, 12
2SD636(R, S)

C	0V
B	0V
E	0V

Q14
2SD636H(R, S)

C	6.2V
B	1.93V
E	1.3V

Q13
2SD636H(R, S)

C	6.9V
B	1.86V
E	1.24V

Q15, 16
2SD965

C	0V
B	0V
E	0V

Q3, 4
2SD661(T. U)

C	7.6V
B	1.2V
E	0.65V

Point (A)

Point (B)

Q1, 2
2SD661(T. U)

C	1.3V
B	0.55V
E	0V

Q301
2SD592NC(R, S)

C	6.4V
B	0.6V
E	0.2V

RECORD/PLAYBACK HEAD

ERASE HEAD

RECORD/PLAYBACK CONNECTION SOCKET

LINE IN

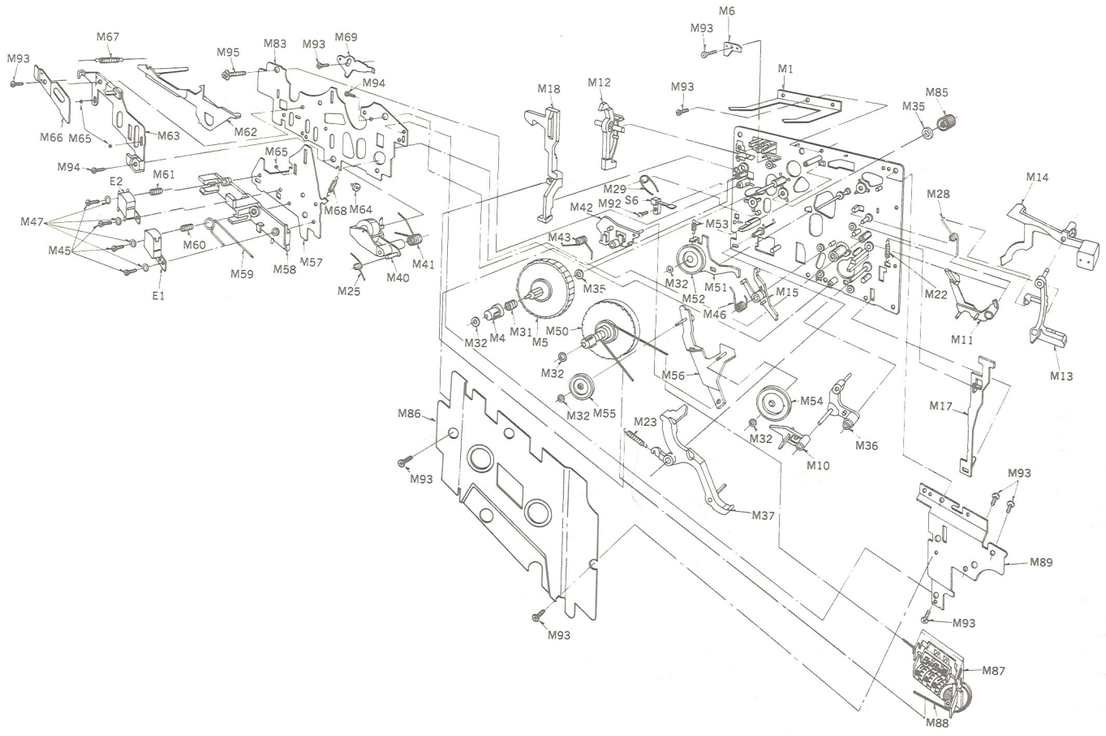
LINE OUT

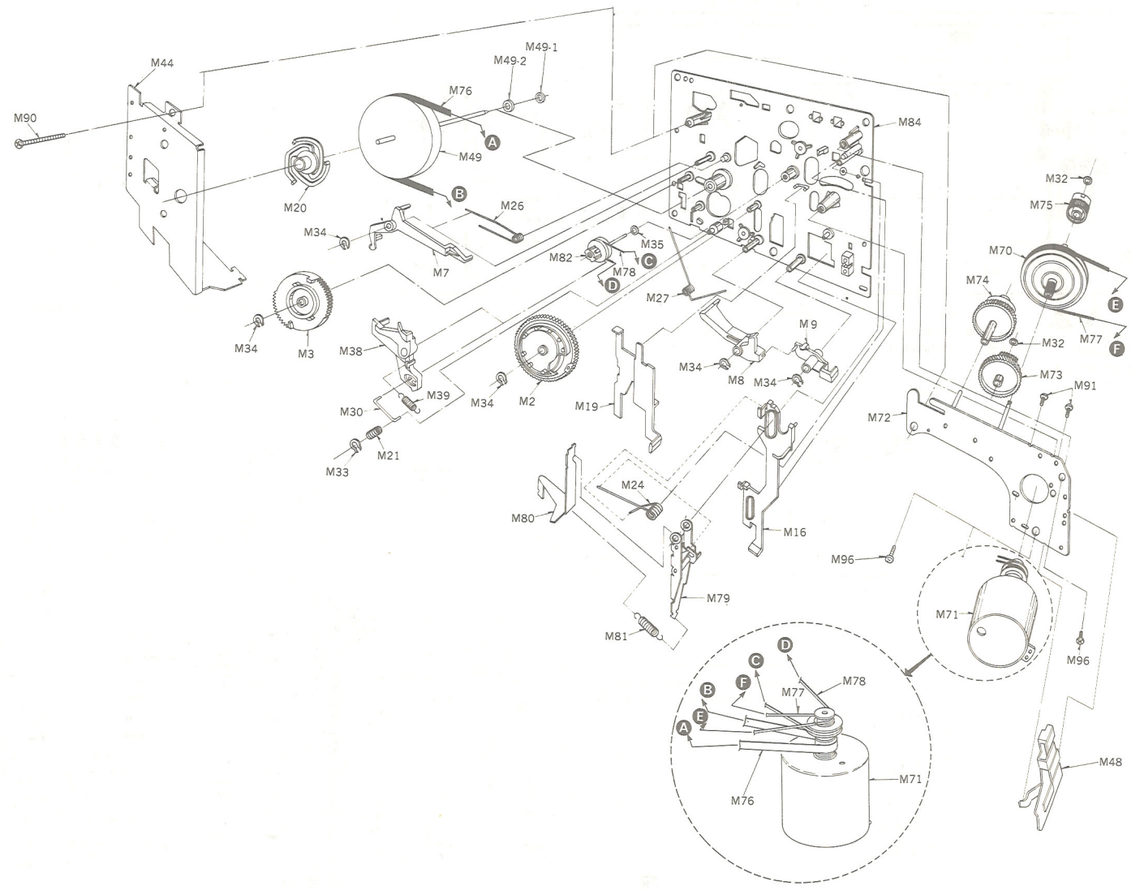
NOTES:

BLK ..... Black
BLU ..... Blue
BRN ..... Brown
GRY ..... Gray
GRN ..... Green
L. BLU ... Light Blue
NIL ..... No Color Mark
ORG ..... Orange
PNK ..... Pink
RED ..... Red
SLD ..... Shield Wire
VLT ..... Violet
WHT ..... White
YEL ..... Yellow

RS-M14

EXPLODED VIEWS





Ref. No.	Part No.	Part Name & Description
		MECHANICAL PARTS
M1	QBP1874	Cassette Pressure Spring
M2	QDG1201	Main Gear
M3	QDG1202	Sub Gear
M4	QMB1336	Supply Reel Table Hub
M5	QDR1139	Supply Reel Table
M6	QMF2118	Fast Forward Arm Bracket
M7	QML3581	Sub Control Lever
M8	QML3583	Main Control Lever
M9	QML3584	Record Operation Lever
M10	QML3586	Head Base Plate Lift Lever
M11	QML3594	Auto-Stop Release Arm
M12	QML3603	Erase Safety Lever
M13	QML3604	Auto-Stop Driving Lever
M14	QML3605	Auto-Stop Detection Lever
M15	QML3592	Change Lever
M16	QMR1820	Record Rod
M17	QMR1821	Auto-Stop Connection Rod
M18	QMR1822	Eject Rod
M19	QMR1824	Control Rod
M20	QMZ1239	Flywheel Thrust Retainer
M21	QBC1357	Lock Pin Pressure Spring
M22	QBT1682	Auto-Stop Connection Rod Spring
M23	QBT1894	Main Lever Spring
M24	QBN1739	Selection Lever Spring
M25	QBN1742	Pressure Roller Release Spring
M26	QBN1744	Sub Gear Spring
M27	QBN1745	Main Gear Spring
M28	QBN1746	Auto-Stop Lever Spring
M29	QBN1747	Connection Spring
M30	QBS1128	Lock Pin
M31	QBC1372	Reel Table Spring
M32	QBW2008	Poly Washer 2φ
M33	XUB4FT	Stop Ring 4φ
M34	QBW2083	Snap Ring 3φ
M35	QBW2012	Poly Washer
M36	QXL1354	Sub Lever Assembly
M37	QXL1355	Main Lever Assembly
M38	QML3582	Pause Lock Lever
M39	QBT1896	Lever Release Spring
M40	QXL1381	Pressure Roller Assembly
M41	QBN1743	Pressure Roller Spring
M42	QML3588	Fast Forward Lever
M43	QBN1748	Fast Forward Spring
M44	QMA3861	Flywheel Retainer
M45	XSN2+10	Screw ⊕2×10
M46	QBN1741	Change Lever Spring
M47	XWA2	Washer 2φ
M48	QMZ1254	Cord Clamper
M49	QXF0164	Flywheel Assembly
M49-1	QBW2049	Poly Washer
M49-2	QBW2026	Snap Ring
M50	QXD1143	Takeup Reel Table Assembly
M51	QXL1382	Idler Lever Assembly
M52	QXI0111	Takeup Idler Assembly
M53	QBT1893	Takeup Idler Spring
M54	QXI0113	Fast Forward Idler Assembly
M55	QXI0112	Rewind Idler Assembly
M56	QXL1383	Fast Forward Arm Assembly
M57	QMK1840	Head Base Plate
M58	QMZ1241	Head Spacer
M59	QBN1740	Head Pressure Spring
M60	QBC1278	Head Spring
M61	QBCA0008	〃
M62	QML3591	Brake Arm
M63	QMZ1240	Sub Head Base Plate
R64	QMN2550	Roller
M65	QDK1017	Steel Ball 2φ
M66	QBP1873	Head Base Plate Pressure Spring
M67	QBT1597	Brake Arm Spring
M68	QBT1892	Head Release Spring
M69	QMA3858	Head Adjustment Plate
M70	QXG1047	Takeup Gear Assembly
M71	QXU0170	Motor Assembly
M72	QXK2286	Sub Chassis Assembly
M73	QDG1199	Auto-Stop Gear
M74	QDG1200	Cam Gear
M75	QDP1823	Connection Pulley
M76	QDB0281	Capstan Belt
M77	QDB0273	Fast Forward Belt
M78	QDB0274	Takeup Belt
M79	QXL1360	Record/Playback Selection Arm Assembly
M80	QML3580	Record/Playback Selection Lever
M81	QBT1895	Record/Playback Selection Lever Spring
M82	QXP0607	Fast Forward Connection Pulley Assembly
M83	QMK1838	Upper Base Plate
M84	QXK2276	Lower Base Plate
M85	QDP1828	Fast Forward Pulley
M86	QXH0327	Chassis Cover Assembly
M87	QXA1060	Tape Counter
M88	QDB0240	Counter Belt
M89	QMA3860	Counter Angle
M90	XTN3+24B	Tapping Screw ⊕3×24
M91	XSN26+3	Screw ⊕2.6×3
M92	XTN2+6B	Tapping Screw ⊕2×6
M93	XTN26+6B	Tapping Screw ⊕2.6×6
M94	XTN26+10B	Tapping Screw ⊕2.6×10
M95	XTN26+12B	Tapping Screw ⊕2.6×12
M96	XTN3+10B	Tapping Screw ⊕3×10

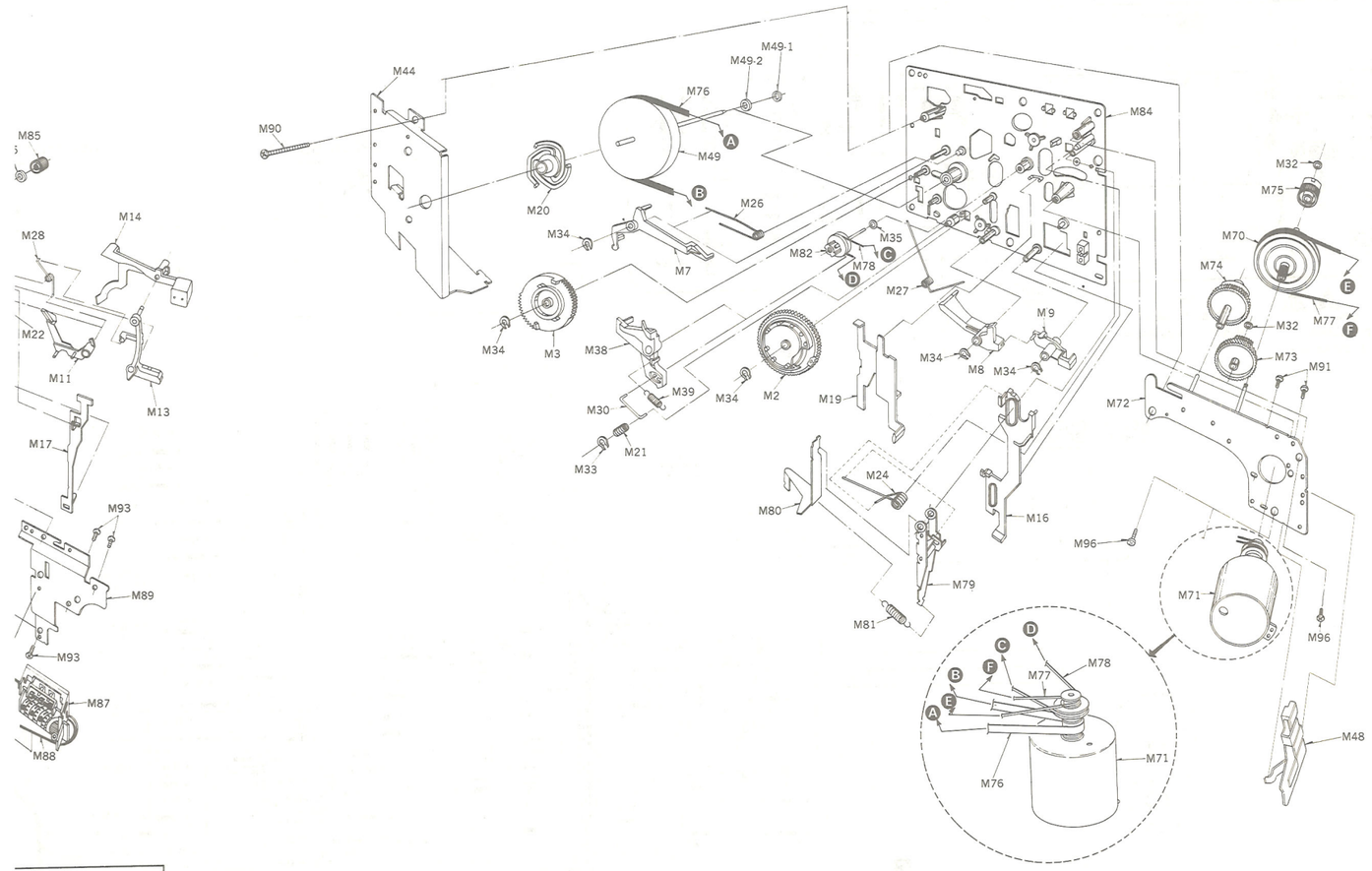
SPECIFICATIONS

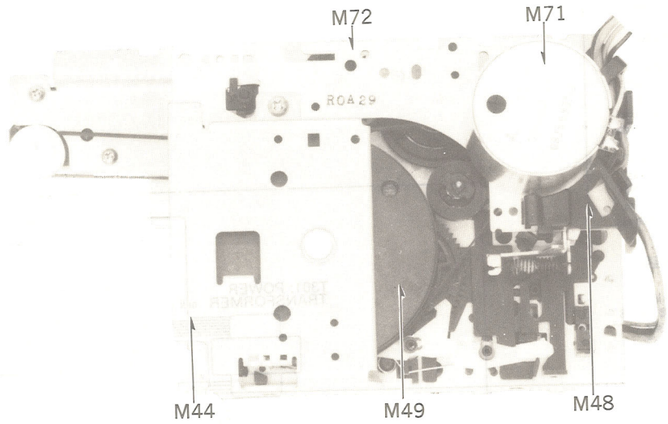
Pressure of pressure roller	350±50 g
Takeup tension * Use cassette torque meter ··· QZZSRKCT	45^{+15}_{-10} g-cm
Wow and flutter; (JIS) * Use test tape ··· QZZCWAT	Less than 0.06% (WRMS)

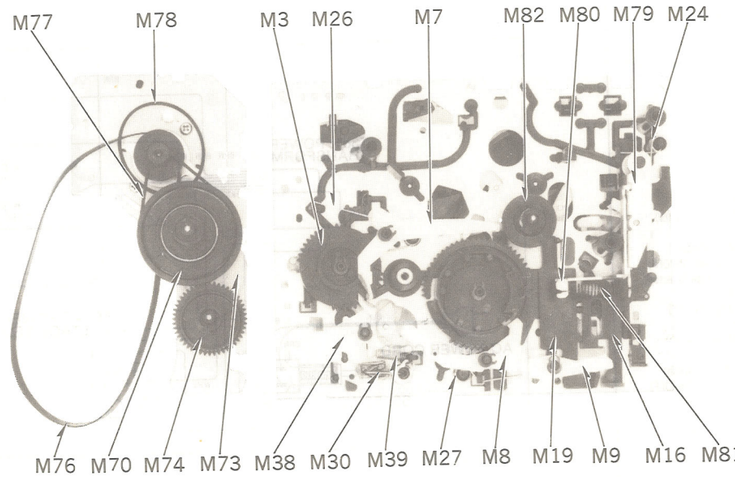
NOTE: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
		ACCESSORIES
A1	RP023A	Connection Cord
A2 NA	QFTC30S011TZ	Demonstration Tape
※For Asia, Latin America, Middle East, Africa areas and Australia.		
A3 NA ⚠	QJP0603S	AC Plug Adaptor
※For Asia, Latin America, Middle East, Africa areas and Australia.		
A4 D	QQT2807	Instruction Book
※For all European areas except United Kingdom.		
BA	QQT2819	〃
※For United Kingdom and Australia.		
N	QQT2842	〃
※For Asia, Latin America, Middle East and Africa areas.		
FJ	QQT2843	〃
※For PX.		
		PACKINGS
P1 DBN	QPN4008	Inside Carton
※For all European areas, Asia, Latin America, Middle East and Africa areas.		
A	QPN4032	〃
※For Australia.		
FJ	QPN4014	〃
※For PX.		
P2	QPA0558	Cushion-A
P3	QPA0559	Cushion-B
P4	XZB40X60A02	Poly Bag
P5 A	QPA0562	Spacer
※For Australia.		
P6		
DBAFJ	QPS0434	Pad
※For all European areas, Australia and PX.		
N	QPG1994	〃
※For Asia, Latin America, Middle East and Africa areas.		

MECHANICAL PARTS LOCATION







Part Name & Description
al Ball 2ø
id Base Plate Pressure Spring
ke Arm Spring
id Release Spring
ad Adjustment Plate
keup Gear Assembly
tor Assembly
o Chassis Assembly
to-Stop Gear
m Gear
nnection Pulley
pstan Belt
st Forward Belt
keup Belt
cord/Playback Selection Arm
sembly
cord/Playback Selection Lever
cord/Playback Selection Lever
pring
st Forward Connection Pulley
ssembly
oper Base Plate
wer Base Plate
st Forward Pulley
hassis Cover Assembly
ape Counter
ounter Belt
ounter Angle
apping Screw ⊕3×24
crew ⊕2.6×3
apping Screw ⊕2×6
apping Screw ⊕2.6×6
apping Screw ⊕2.6×10
apping Screw ⊕2.6×12
apping Screw ⊕3×10

SPECIFICATIONS

Pressure of pressure roller	350±50 g
Takeup tension * Use cassette torque meter ··· QZZSRKCT	45^{+15}_{-10} g-cm
Wow and flutter ; (JIS) * Use test tape ··· QZZCWAT	Less than 0.06% (WRMS)

NOTE: ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
		ACCESSORIES
A1	RP023A	Connection Cord
A2 NA	QFTC30S011TZ	Demonstration Tape
※For Asia, Latin America, Middle East, Africa areas and Australia.		
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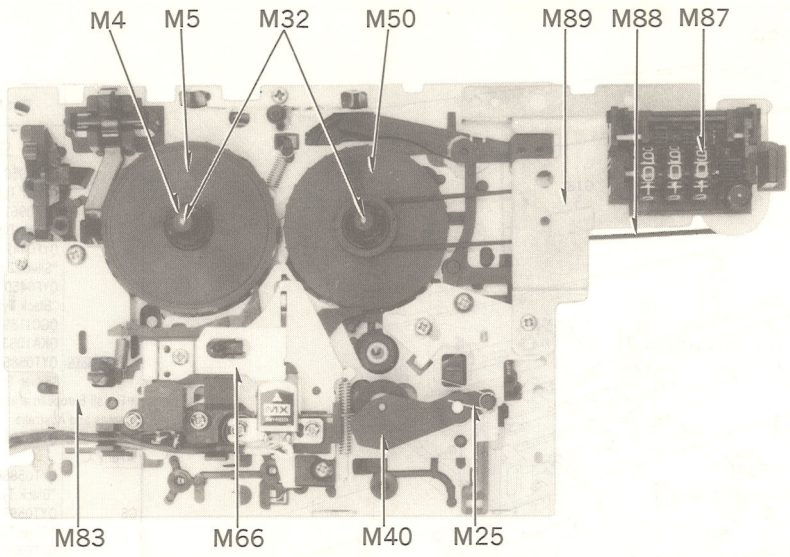
※For Asia, Latin America, Middle East, Africa areas and Australia.		
A4 D	QQT2807	Instruction Book
※For all European areas except United Kingdom.		
BA	QQT2819	〃
※For United Kingdom and Australia.		
N	QQT2842	〃
※For Asia, Latin America, Middle East and Africa areas.		
PJ	QQT2843	〃
※For PX.		
		PACKINGS
P1 DBN	QPN4008	Inside Carton
※For all European areas, Asia, Latin America, Middle East and Africa areas.		
A	QPN4032	〃
※For Australia.		
PJ	QPN4014	〃
※For PX.		
P2	QPA0558	Cushion-A
P3	QPA0559	Cushion-B
P4	XZB40X60A02	Poly Bag
P5 A	QPA0562	Spacer
※For Australia.		
P6		
DBAPJ	QPS0434	Pad
※For all European areas, Australia and PX.		
N	QPG1994	〃
※For Asia, Latin America, Middle East and Africa areas.		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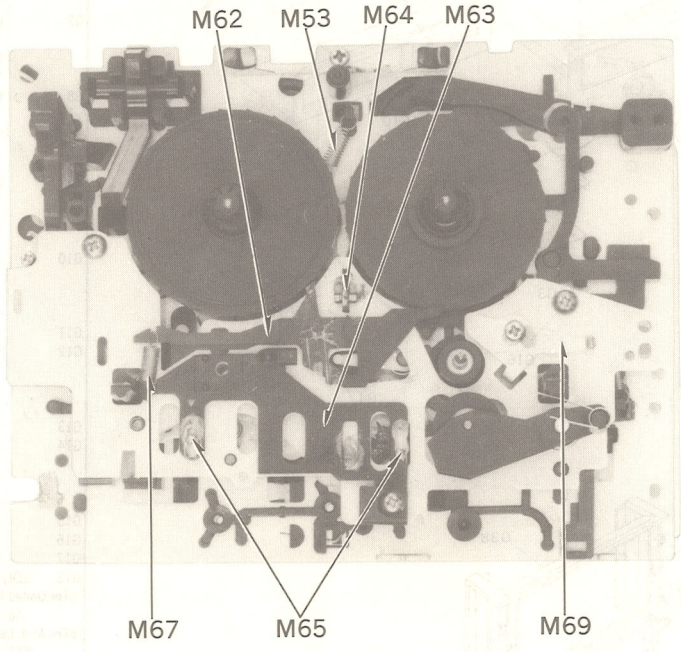
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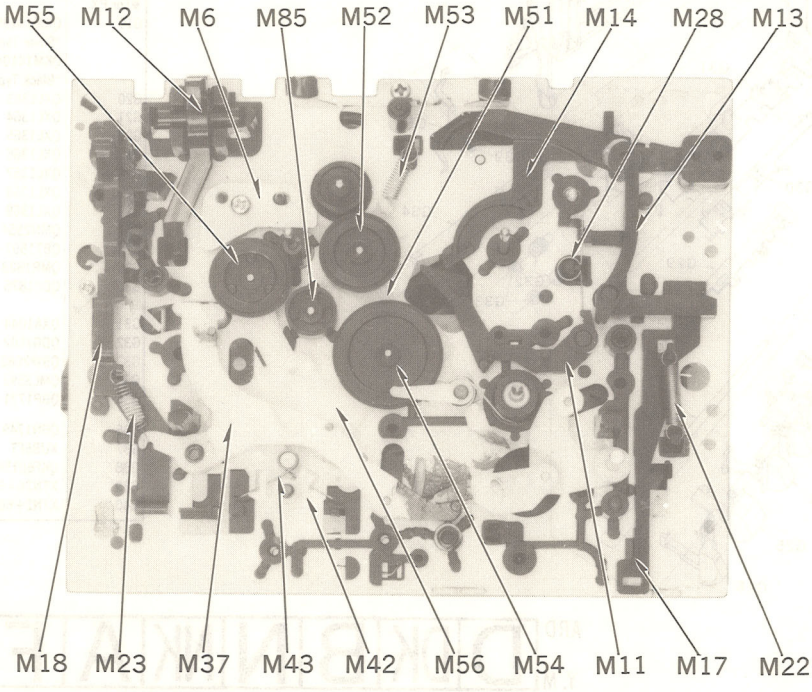
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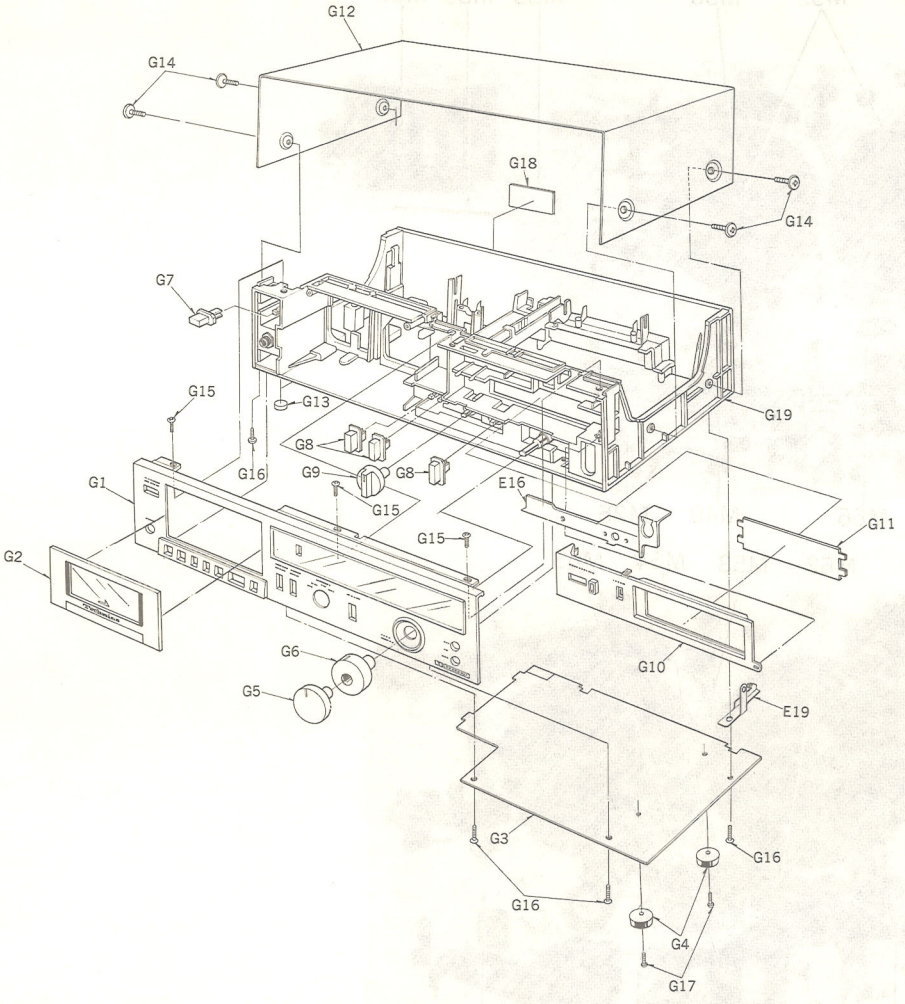
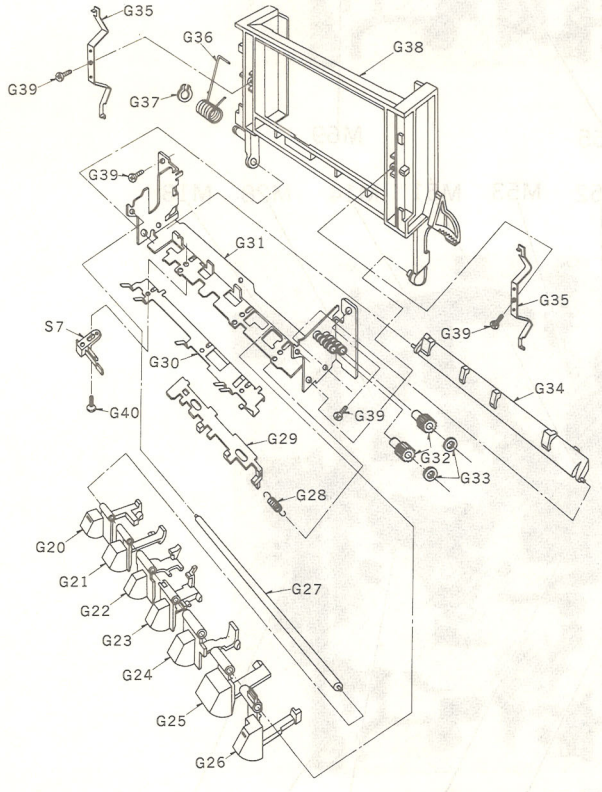
M22

CABINET PARTS





Ref. No.	Part No.	Part Name & Description
	CABINET PARTS	
G1	QYP0950 "Silver Type"	Front Panel Assembly
	QYP0961 "Black Type"	〃
G2	QYF0442 "Silver Type"	Cassette Lid Assembly
	QYF0450 "Black Type"	〃
G3	QGC1189	Bottom Cover
G4	QKA1083	Rubber Foot
G5 DBNA	QYT0586 "Silver Type"	Volume Knob-A Assembly
※For all European areas, Asia, Latin America, Middle East, Africa areas and Australia.		
FJ	QYT0595	〃
※For PX.		
	QYT0586K "Black Type"	〃
G6	QYT0587 "Silver Type"	Volume Knob-B Assembly
	QYT0587K "Black Type"	〃
G7	QGG1728 "Silver Type"	Push Button (Power ON/OFF)
	QGG1728K "Black Type"	〃
G8	QGG1727 "Silver Type"	Push Button (Input Select, Tape Select, Rec Mute)
	QGG1727K "Black Type"	〃
G9	QGT1495 "Silver Type"	Tape Select Knob
	QGT1495K "Black Type"	Tape Select Knob
G10	QGK3044 "Silver Type"	Meter Cover
	QGK3044K "Black Type"	〃
G11	QGL1140	Meter Filter
G12	QGC1188 "Silver Type"	Case Cover
	QGC1188K "Black Type"	〃
G13	QKA1081	Case Foot
G14	XTB4+10BFN "Silver Type"	Tapping Screw ⊕4×10
	XTB4+10BFZ "Black Type"	Tapping Screw ⊕4×10
G15	XTS3+10B	Tapping Screw ⊕3×10
G16	XTN3+10B	〃
G17	QHQ1299	Screw
G18 BA	QGS2796	Main Name Plate
※For United Kingdom and Australia.		
N	QGS2798	〃
※For Asia, Latin America, Middle East and Africa areas.		
FJ	QGS2799	〃
※For PX.		
G19	QKM1419H "Silver Type"	Main Case
	QKM1419K "Black Type"	〃
G20	QXL1363	Eject Button Assembly
G21	QXL1364	Record Button Assembly
G22	QXL1365	Rewind/Review Button Assembly
G23	QXL1366	Fast Forward/Cue Button Assembly
G24	QXL1367	Playback Button Assembly
G25	QXL1368	Stop Button Assembly
G26	QXL1369	Pause Button Assembly
G27	QMN2554	Operation Lever Shaft
G28	QBT1597	Obstruction Rod Spring
G29	QMR1823	Obstruction Rod
G30	QBP1875	Operation Lever Spring
G31	QXA1044	Operation Button Angle Assembly
G32	QDG1102	Holder Gear
G33	QBW2082	Snap Ring 4φ
G34	QML3593	Lock Arm
G35	QBP1771	Holder Spring
G36	QBN1749	Eject Spring
G37	XUB5FT	Stop Ring 5φ
G38	QKF6015K	Cassette Holder
G39	XTN26+6B	Tapping Screw ⊕2.6×6
G40	XTN2+6B	Tapping Screw ⊕2×6

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RS-M14 FRANCAIS

MESURES ET REGLAGE

NOTA:

Pour garder l'appareil en bon état de marche, positionner les commuteurs á levier et les commandes dans les positions suivantes, sauf indication contraire.

- Vérifiez que les têtes soiènt propres.
- Vérifiez que le cabestan et le galetpressure soient propres.
- Température ambiante admissible: 20±5°C.
- Sélecteur de Dolby: OUT.
- Sélecteur de bande: position normal.
- Commutateur de test de crête: LINE.
- Commande de niveau: MAX.

SECTION	MESURES ET REGLAGES
Ⓐ **Réglage de la position de la tôte** Condition: * Le mode de lecture et pause	Il y a une plaque de réglage de la tête pour ajuster le contact de bande de la tête en mode de repérage avant ou arrière. 1. Appuyer sur le bouton de lecture (PLAY) et le bouton de pause. 2. Mesurer l'espace qui sépare le galet presseur du cabestan. Valeur standard: 0.5±0.3mm 3. Si la valeur mesurée se trouve hors tolérances, desserrer la vis A, et glisser la plaque de réglage de la tête dans la direction de la flèche B pour effectuer le réglage.
Ⓑ **Azimutage de tête** Condition: * Position lecture Equipement: * Voltmètre électronique * Oscilloscope * Bande étalon (azimutage)...QZZCFM * Bande étalon (Fenêtre de passagede la band avec mirroir) ...QZZCRD	**Réglage de la tête d'enregistrement/lecture** 1. Branchez les appareils comme ci-dessous. (Voir Fig. 24). 2. Lisez la bande étalon d'azimutage (QZZCFM, 8kHz). 3. Réglez la vis d'orientation (B) Fig. 25, de la tête d'enregistrement/lecture pour obtenir le niveau maximal à la sortie LINE OUT. 4. Mesurez les deux canaux, et ajustez les niveaux à égalite de tension de sortie. 5. Après réglage, bloquez la vis par une goutte de vernis. **Réglage de la tête d'effacement** 1. Le branchement de l'équipement d'esai est pareil que cidessus mais utiliser le visionneur du chemin de bande (QZZCRD) au lieu de la bande d'essai (QZZCFM). 2. Ecouter cette bande. 3. Régler la vis (C) montrée à la Fig. 26, de sorte que la bande ne se vrille pas, ni soit déformée par les guides de la bande de la tête d'effacement. 4. Après réglage, bloquez la vis par une goutte de vernis.
Ⓒ **Vitesse de défilement** Condition: * Position lecture Equipement: * Compteur électronique numérique ou fréquencemètre numérique * Bande étalon...QZZCWAT	**Précision de la vitesse de défilement** 1. Branchez les appareils comme ci-dessous. (Voir fig. 27). 2. Lisez la bande étalon (QZZCWAT, 3000Hz) et appliquez le signal de sortie au fréquencemètre. 3. Mesurez sa fréquence. 4. Sur la base de 3000Hz, déteminez la valeur à l'aide de la formule. $\text{Précision de vitesse} = \frac{f-3000}{3000} \times 100(\%)$ avec f = valeur mesurée. 5. Effectuez la mesure sur la partie médiane de la bande. **Valeur normale: ±1.5%** **Méthode de réglage** 1. Lisez la bande étalon (milieu). 2,3. Ajustez la vis de réglage de vitesse VR indiquée fig. 22 pour que la fréquence devienne égale à 3000Hz. **Eluctuations de vitesse de défilement** Faites les mesures de la même facon que ci-dessus (au début, au milieu et en fin de bande) et déterminez la différence entre les valeurs maximale et minimale, puis calculez comme suit. $\text{Fluctuations de vitesse} = \frac{f_1-f_2}{3000} \times 100(\%)$ f_1 = valeur maximale f_2 = valeur minimale **Valeur normale: monis de 1%** **Nota:** Utiliser un tournevis non métallique pour régler la vitesse de bande de cet appareil avec précision.

SECTION	MESURES ET REGLAGES
Ⓓ **Réponse en fréquence à la lecture** Condition: * Position lecture * Sélecture de bande ...position Normal Equipement: * Voltmètre électronique * Oscilloscope * Bande étalon...QZZCFM	1. Branchez les appareils de mesure comme pour "l'azimutage de tête", mais en utilisant la bande étalon (QZZCFM) au lies de la bande étalon d'azimutage (Voir Fig. 24). 2. Placez l'appareil en position lecture. 3. Lisez la bande étalon de courbe de réponse (QZZCFM). 4. Mesurez les niveaux de sortie à 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz et 63Hz et comparez chaque niveau de sortie avec celui de la fréquence étalon de 315Hz, sur la borne LINE OUT. 5. Effectuez la mesure sur les deux canaux. 6. Vérifiez que les valeurs mesurées se situent à l'intérieur du gabarit de courbe de réponse. (Voir Fig. 28).
Ⓔ **Gain à la lecture** Condition: * Position lecture * Sélecteur de bande ...position Normal Equipement: * Voltmètre électronique * Oscilloscope * Bande éltalon...QZZCFM	1. Branchez les appareils comme ci-dessous. (Voir fig. 24). 2. Lisez la partie "niveau standard" de la bande étalon (QZZCFM, 315Hz) et mesurez le niveau de sortie, avec le voltmètre électronique, sur le jack LINE OUT. 3. Effectuez les mesures sur les deux canaux. **Valeur normale: Autour de 0.39V** **Réglage** 1. Si la valeur mesurée n'est pas correct, réglez VR1 (canal gauche) et VR2 (droit) (Voir fig. 22). 2. Après réglage, vérifiez à nouveau la "réponse en fréquence à la lecture".
Ⓕ **Fultes de prémagnétisation** Condition: * Position enregistrement * Sélecteur de bande ...position Metal * Commande de niveau ...MAX. Equipement: * Voltmètre électronique * Oscilloscope	1. Branchez les appareils comme ci-dessous (Voir Fig. 29). 2. Placez l'appareil en position enregistrement. 3. Réglez les bobines de la trappe L1 (canal gauche) et L2 (droit) pour que la mesure soit au minimum. 4. Effectuez ce réglage pour les deux canaux.
Ⓖ **Courant d'effacement** Condition: * Position enregistrement * Sélecteur de bande ...position Metal Equipement: * Voltmètre électronique * Oscilloscope	1. Branchez les appareils comme ci-dessous. (Voir fig. 30). 2. Appuyez sur les boutons d'enlegistrement et de pause. 3. Place le selecteur de bande à la position "Metal". 4. Déterminer le courant d'effacement avec la formule suivante. $\text{Courant d'effacement (A)} = \frac{\text{Tension aux bornes de la résistance R301 (V)}}{1(\Omega)}$ **Valeur normale: 155±15mA (position Metal)** 5. Si la valeur mesurée ne correspond pas à la norme, réglez de la maniére suivante. **Réglage** 1. Ouvrir le point (A) et court-circuiter le point (B) sur la plaquette de circuit principale dans le schéma de câblage. (Voir page 10). 2. Mesurer la valeur du courant d'effacement. 3. S'assurer que la valeur mesurée se trouve entre 145mA et 170mA. 4. Si elle se situe au-delà de la valeur, proéder aux réglages suivants. • Si le courant d'effacement est inférieur à 140mA, courtcircuiter le point (A). • Si le courant d'effacement est supérieur à 170mA, ouvrir le point (A) et le point (B).

SECTION	MESURES ET REGLAGES
Ⓗ Courant de prémagnétisation Condition: * Position enregistrement * Sélecteur de bande ...position Normal ...position Fe-Cr ...position CrO_2 ...position Metal Equipement: * Voltmètre électronique * Oscilloscope	1. Branchez les appareils selon la Fig. 31. 2. Placez l'appareil en position enregistrement, le sélecteur de bande sur "normal" (pour bande normale). 3. Lisez la tension sur le voltmètre électronique et calculez le courant de prémagétisation selon la formule. Courant de prémagnétisation (A) = $= \frac{\text{Tension lue sur voltm. élec. (V)}}{10(\Omega)}$ **Valeur normale: Autour de 410μA (position Normal)** 4. Réglez VR7 (canal gauche) et VR8 (canal droit) (voir emplacements des organes de réglage en Fig. 22). 5. Positionner le sélecteur de bande sur chaque position. 6. Vérifiez si la valeur mesurée correspond a la norme. **Valeur normale: Autour de 440μA (position Fe-Cr)** **Autour de 545μA (position CrO_2)** **Autour de 800μA (position Metal)**
Ⓘ Gain global Condition: * Positions enregistrement/lecture * Commande de niveau LINE IN...MAX. * Niveaux d'entrée normaux MIC −72±4dB LINE IN −24±4dB Equipement: * Générateur AF * Voltmètre électronique * Atténuateur * Oscilloscope * Bande étalon vierge QZZCRA pour type de bande normale * Resistance (600Ω)	1. Branchez les appareils comme sur la Fig. 32. 2. Placez l'appareil en position enregistrement, le sélecteur de bande sur position normale. 3. Appliquez un signal à 1kHz (−24dB) du générateur AF, à travers l'atténuateur, à l'entrée LINE IN. 4. Réglez l'atténuateur pour que le niveau d'écoute simultanée sur LINE OUT soit de 0,39V (−7dB). 5. Faistes un enregistrement avec la bande étalon (QZZCRA). 6. Lisez la bande ainsi enregistrée, et vérifiez que la valeur lue sur le voltmètre électronique branché sur LINE OUT est bien de 0,39V (−7dB). 7. Si la valeur mesurée est différente, réglez VR5 (canal gauche) et VR6 (droit) (voir page 22). 8. Recommencez à partir du palier (2).
Ⓙ Courbe de réponse globale Condition: * Positions enregistrement/lecture * Commande de niveau ...MAX. * Sélecteur de bande ...position Normal ...position Fe-Cr ...position CrO_2 ...position Metal Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Oscilloscope * Bande étalon vierge ...QZZCRA pour type normal ...QZZCRY pour Fe-Cr ...QZZCRX pour CrO_2 ...QZZCRZ pour Metal * Resistance (600Ω)	**Nota:** Avant de mesurer et régler, vérifiez que la courbe de réponse en lecturen est correct (pour la méthode de mesure, reportez-vous au paragraph considéré). 1. Branchez les appareils de mesure comme surla Fig. 32. 2. Mettre la cassette d'essai (QZZCRA) en place dans le support de la cassette. 3. Placez l'appareil enposition enregistrement, le sélecteur de bande sur "Normal". 4. Appliquez un signal à 1kHz du générateur AF, à travers l'atténuateur, à l'entrée LINE IN. 5. Réglez l'atténuateur pour que le niveau d'entrée soit inférieur de −20dB au niveau étalon d'enregistrement. 6. A ce moment, le niveau sur LINE OUT est de 0.039V. 7. Enregistrez les frequences de 1kHz, 50Hz, 200Hz, 4kHz, 8kHz et 10kHz (12kHz pour band Fe-Cr, CrO_2 et Metal) à niveau constant. 8. Lisez cet enregistrement et exprimez en dB les différences entre le niveau de sortie de chaque fréquence et le niveau à 1kHz. 9. S'assurer que la valeur mesurée se trouve dans la plage spécifiée dans le diagramme de réponse en fréquences générale. 10. Changer la bande d'essai sur Fe-Cr (QZZCRY), CrO_2 (QZZCRX) ou Metal (QZZCRZ). 11. Positionner le sélecteur de bande sur chaque position. 12. Mesurer de la même manière de l'étape 3 à l'étape 8.

SECTION	MESURES ET REGLAGES
	13. S'assurer que la valeur mesurée se trouve dans la plage spécifiée dans le diagramme de la réponse en fréquences totale pour les bandes CrO_2 et Metal montré dans les figures 34. **Réglage—Utilisation du courant de polarisation** 1. Lorsque la réponse en fréquence entre la plage de fréquences moyennes et des fréquences élevées devient supérieure à la valeur standard, comme montré par la ligne continue dans la Fig. 35, se référer au réglage du courant de polarisation. 2. Si elle diminue, comme montré par la ligne pointillée, se référer au réglage du courant de polarisation. **Nota:** Pour la mesure du courant de prémagnétisation, reportez-vous au paragraphe correspondant.
Ⓚ Indicateur de niveau Condition: * Position enregistrement * Commande de niveau ...MAX. * Selecteur de band ...position Normal Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Resistance (600Ω)	1. Branchez les appareils comme sur la Fig. 32. 2. Comme il est montré à la Fig. 36, le branchement de la base de Q402 à la terre arrête les oscillations du multivibrateur instable comprenant Q402 et Q403. 3. Alimenter d'un 1kHz (−24dB) a la fiche "LINE IN", puis pousser le bouton d'enregistrement. 4. Régler le ATT de telle façon à ce que le niveau de sortie à la fiche "LINE OUT" devienne 0.39V (Le niveau d'entreé à cette position est nommé le niveau d'entree standard). 5. Réglage au "−20dB". A. Réglez l'atténuateur pour que le niveau d'entrée soit inférieur de −20dB au niveau é talon d'enregistrement. B. Réglez VR401 de tel façon que le segment de −20dB s'allume dans la zone de −20dB±0.8dB. (L-CH seulement) (Voir Fig. 37). 6. Réglage au "0dB". A. Régler le ATT de telle façon à ce que le niveau de sortie à la fiche "LINE OUT" devienne 0.39V. B. Réglez VR402 de tel façon que le segment de +1dB s'allume dans la zone de 0±0.2dB du niveau d'entreé standard (Voir Fig. 38). 7. Répéter deux fois les étapes 5 à 6 ci-dessus. 8. Réglez l'ATT et vérifiez si tous les segments s'allument quand le niveau d'un signal d'entreé est augmenté de 10dB au dessus du niveau d'entreé standard (Voir Fig. 39).
Ⓛ Circuit Dolby Condition: * Position enregistrement * Commande de niveau LINE IN...MAX. * Sélecteur de Dolby ...OUT/IN Equipement: * Voltmètre électronique * Générateur AF * Atténuateur * Oscilloscope * Resistance (600Ω)	1. Branchez les appareil comme sur la Fig. 40. 2. Placez l'appareil en position enregistrement et le sélecteur Dolby en position OUT, puis appliquez un signal à 5kHz à l'entrée LINE IN pour obtenir −34.5dB sur TP11 (canal gauche) et TP12 (droit). 3. Vérifiez que la valeur en position IN du sélecteur Dolby augmente de 8 (±2.5)dB par rapport à celle obtenue en position OUT.

RS-M14 DEUTSCH

Messungen und Einstellungen

Anm.:

Für gute Meßbedingungen sorgen. Falls nicht anders angegeben, die Schalter und Regler in folgende positionen stellen.

- Für saubere Köpfe sorgen.
- Für saubere Tonwelle und Andruckrolle sorgen.
- Auf normale Raumtemperature achten: 20±5°C
- Dolby-Schalter: Aus.
- Bandwahl Schalter: Normal-Position.
- Spitzenwertschalter: LINE.
- Eingangsregler: MAX.

Gegenstand	Messung und Einstellung
Ⓐ Tonkopf-Positionierung Bedingung: * Wiedergabe und Pause	Die Tonkopf-Positionierplatte dient zum Einstellen des Kontakts zwischen Tonkopf und Band während der Betriebszustände „Cue" und „ Review". 1. Die Wiedergabetaste PLAY und die Pausetaste drücken. 2. Den Abstand zwischen der Andrucksrolle und der Tonwelle messen. Sollwert: 0,5±0,3mm 3. Falls der Meßwert außerhalb des Toleranzbereichs liegt, die Schraube A lösen und die Tonkopf-Positionierplatte in Pfeilrichtung B schieben, um den Kopfkontakt einzustellen.
Ⓑ Senkrechtstellen des Kopfes Bedingung: * Wiedergabe Meßgerät: * Röhrenvoltmeter * Oszillograf * Testband...QZZCFM * Testband (Bandlaufweg-Betrachtungsvorrichtung mit Spiegl)...QZZCRD	**Justage des Aufnahme/Wiedergabekopfes** 1. Den Meßaufbau zeigt Fig. 24. 2. Testband (QZZCFM, 8kHz) wiedergeben. 3. Einstellschraube (B) (Fig. 25) auf maximale Ausgangsspannung einstellen. 4. Beide Kanäle überprüfen und auf gleiche Ausgangsspannung einstellen. 5. Nach dem Abgleich Einstellschraube mit Lach sichern. **Abstimmung des Löschkopfes** 1. Der Meßaufbau ist gleich, wie oben doch wird anstelle des Testband (QZZCFM) das Bandspur-Sichtgerät (QZZCRD) verwendet. 2. Dieses Band wiedergeben. 3. Schrube (C) in Fig. 26 so daß das Band nicht gekräuselt oder durch die Bandführungen des Löschkopfes verformt werden kann. 4. Nach dem Abgieich Einstellschraube mit Lack sichern.
Ⓒ Bandgeschwindigkeit Bedingung: * Wiedergabe Meßgerät: * Elektronischer Digitalzähler * Testband...QZZCWAT	**Genauigkeit der Bandgeschwindigkeit** 1. Den Meßaufbau zeigt Fig. 27. 2. Testband (QZZCWAT 3000Hz) wiedergeben und Ausgangssignal dem Zähler zuführen. 3. Frequenz messen. 4. Beträgt die auf dem Testband aufgezeichnete Frequenz 3000Hz, so ergibt sich die Genauigkeit nach folgender Formal: Genauigkeit der Bandgeschwindigkeit = $\frac{f-3000}{3000}\times 100(\%)$ worin f die gemessene Frequenz ist. 5. Die Messung soll im mittleren Teil des Bandes erfolgern. **NORMALWERT: ±1,5%** **Einstellung:** 1. Den mittleren Teil des Testbandes wiedergeben. 2,3. Die Einstellschraube VR Vgl Fig. 22 so verstellen, daß eine Frequenz von 3000Hz angezeig wird. **Schwankung der Bandgeschwindigkeit:** Messung, wieoben beschrieben für Anfang, mittleren Teil und Ende des Testbandes wiederholen und Schwankung wie folgt bestimmen: Schwankung = $\frac{f_1-f_2}{3000}\times 100(\%)$ f_1 = Maximalwert f_2 = Minimalwert **NORMALWERT: Weniger als 1%** **Anm:** Verwenden Sie einen nichtmetallischen Schraubenzieher wenn Sie die Bandgeschwindigkeit justieren.

Gegenstand	Messung und Einstellung
Ⓓ Frequenzgand bie Wiedergabe Bedingung: * Wiedergabe * Bandwahl Schalter ...Normal position Meßgerät: * Röhrenvoltmeter * Oszillograf * Testband...QZZCFM	1. Den Meßaufbau zeigt Fig. 24, jedoch ist jetzt das Testband QZZCFM zu verwenden. 2. Gerät auf "wiedergabe" schalten. 3. Frequenzgang-Testband QZZCFM wiedergeben. 4. Ausgangsspannungen bei 315Hz, 12,5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz und 63Hz mit Ausgangsspannung der Standard Frequenz 315Hz vergleichen. 5. Messungen an beiden Kanälen durchfüberen. 6. Prüfen, ob die Werte innerhalb der in Fig. 28, dargestellten Kurven liegen.
Ⓔ Wiedergabe-Verstärkung Bedingung: * Wiedergabe * Bandwahl Schalter ...Normal position Meßgerät: * Röhrenvoltmeter * Oszillograf * Testband...QZZCFM	1. Den Meßaufbau zeigt Fig. 24. 2. Standard-Frequenz (QZZCFM 315Hz) vom Testband wiedergeben und Ausgangsspannung messen. 3. Messung an beiden Kanälen durchführen. **NORMALWERT: Ungefähr 0,39V** **Einstellung:** 1. Abweichungen können durch Abgleich von VR1 (Linker Kanal) und VR2 (Rechter Kanal) (S. Fig. 22) korrigiert werden. 2. Nach effolgtem Abgleich ist der Frequenzgang bei Wiedergabe erneut zu kontrollieren.
Ⓕ Störstrahlung der Vormagnetisierung Bedingung: * Aufnahme * Bandwahl Schalter ...Metal position * Eingangsregler...Max. Meßgerät: * Elekeronisches Voltmeter * Oszillograf	1. Die Verbindnngen des Prüfaufbaus sind nachstehend Wiedergegeben. (S. Fig. 29). 2. Gerät auf Aufnahme schalten. 3. Sperrkreisspulen L1 (Linker Kanal) und L2 (Rechter Kanal) so abgleichen daß der Meßwert minimal wird. 4. Beide kanäle abgleichen.
Ⓖ Löschstrom Bedingung: * Aufnahme * Bandwahl Schalter ...Metal position Meßgerät: * Röhrenvoltmeter * Oszillograf	1. Den Meßaufbau zeigt Fig. 30. 2. Die Aufnahme-und Pausentaste drücken. 3. Den Bandwahlschalter in die „Metal"-Position stellen. 4. Löschstrom nach folgender Formel emitteln: Löschstrom (A) = $\frac{\text{Die Spannung über beide Enden von R301(V)}}{\text{1 (Ohm)}}$ **NORMALWERT: 155±15mA (Metal position)** 5. Falls der Meßwert nicht im vorgeschriebenen Bereich liegt, auf folgende Weise einstellen. **Einstellung:** 1. Die Stelle (A) unterbrechen und den Punkt (B) im Verdrahtungsplan auf der Hauptleiterplatte kurzschließen. (Siehe Seite 10.) 2. Den Löschstrom messen. 3. Überprüfen, ob der gemessene Löschstrom zwischen 140mA und 170mA liegt. 4. Falls er außerhalb dieses Bereichs liegt, folgende Schritte ausführen. • Beträgt der Löschstrom weniger als 140mA, den Punkt (A) kurzschließen. • Beträgt der Löschstrom mehr als 170mA, die Stellen (A) und (B) unterbrechen.

Gegenstand	Messung und Einstellung
(H) Vormagnetisierung Bedingung: * Aufnahme * Bandwahl Schalter ...Normal position ...Fe-Cr position ...CrO_2 position ...Metal position Meßgerät: * Röhrenvoltmeter * Oszillograf	1. Den Meßaufbau zeigt Fig. 31. 2. Gerät auf "Aufnahme" und Bandwahlschalter auf "Normal" schalten. 3. Spannung vom Röhrenvoltmeter ablesen und Vormagnetisierungsstrom nach folgender Formel berechnen: Vormagnetisierungsstrom (A) = $= \frac{\text{Spannung am Röhrenvoltmeter (V)}}{10(\Omega)}$ **NORMALWERT: Ungefähr 410μA (Normal position)** 4. VR7 (Linker Kanal) und VR8 (Rechter Kanal) abgleichen (S. Fig. 22). 5. Den Bandsortenwähler in jede Position stellen. 6. Überprüfen, ob der Meßwert im vorgeschriebenen Bereich liegt. **NORMALWERT: Ungefähr 440μA (Fe-Cr position)** **Ungefähr 545μA (CrO_2 position)** **Ungefähr 800μA (Metal position)**
(I) Gesamt-Verstärkung Bedingung: * Aufnahme und Wiedergabe * NF-Eingangsregler...Max. * Standard-Eingangspegel Mikrofon −72±4dB NF-Eingang −24±4dB Meßgerät: * NF-Generator * Röhrenvoltmeter * Abschwächer * Oszillograf * Testband (Leerband) QZZCRA für Normal * Widerstand (600Ω)	1. Den Meßaufbau zeigt Fig. 32. 2. Gerät auf "Aufnahme", und Bandwalschalter auf Normal Position stellen. 3. Über den Abschwächer 1kHz aus dem NF-Generator (−24dB) dem NF-Eingang zuführen. 4. Den Abschwächer so einstellen, daß am NF-Ausgang stehen. 0,39V (−7dB) stehen. 5. Dieses Signal auf Testband (QZZCRA) aufnehmen. 6. Diese Aufnahme wiedergeben und prüfen, ob am NF-Ausgang 0,39V (−7dB) stehen. 7. Ist des nicht der Fall, so sind VR5 (linker Kanal) und VR6 (rechter Kanal) entsprechend abzugleichen (Siehe Seite 22), 8. Ab Punkt 2 wiederholen.
(J) Gesamt-frequenzgang Bedingung: * Aufnahme und Wiedergabe * Eingangsregler...Max. * Bandwahl Schalter ...Normal position ...Fe-Cr position ...CrO_2 position ...Metal position Meßgerät: * Röhrenvoltmeter * NF-Generator * Abschwächer * Oszillograf * Testband (Leerband) QZZCRA für Normal QZZCRY für Fe-Cr QZZCRX für CrO_2 QZZCRZ für Metal * Widerstand (600Ω)	**Anm.:** Vor Messung und Abgleich des Gesamtfrequenzganges ist sicherzustellen, daß der Frequenzgang bei Wiedergabe korrekt ist (Vgl. entspr. Abschnitt). 1. Den Meßaufbau zeigt Fig. 32. 2. Testband (QZZCRA) in das Cassettenfach einsetzen. 3. Gerät auf "Aufnahme" und Bandwahlschalter auf "Normal" schalten. 4. 1kHz vom NF-Generator über den Abschwächer dem NF-Eingang zuführen. 5. Den Abschwächer so einstellen, daß der Eingangspegel −20dB des Stand-Aufnahmepegels beträge. 6. Zu diesem Zeitpunkt beträgt der Ausgangspegel 0,039V. 7. Bei dem gleichen Pegel sind die Frequenzen 1kHz, 50Hz, 200Hz, 4kHz, 8kHz und 10kHz (12kHz für Fe-Cr, CrO_2 und Metal band) aufzunehme. 8. Diese Aufnahme wiedergeben und dabei die Abweichungen der Pegel der einzeinen Frequenzen vom 1kHz-Pegel in dB bestimmen. 9. Überprüfen, ob der Meßwert innerhalb dea Bereichs liegt, der in dem Frequenzgangdiagramm dangegeben ist. 10. Nacheinander das Fe-Cr Testband (QZZCRY) das CrO_2 Testband (QZZCRX) unddas Metal Testband (QZZCRZ) benutzen. 11. Den Bandsortenwähler in jede Position stellen. 12. Bei der Messung von Schritt 3 bis 8 auf die gleiche weise vorgehen.

Gegenstand	Messung und Einstellung
	13. Überzeugen Sie sich, ob der gemessene Wert in dem angegebenen Bereich liegt. (Siehe Diagramm für die Frequenzgänge von CrO_2 und Metal bande, Fig. 34). **Abgleich mit Vormagnetisierungsstrom** 1. Wenn der Frequenzgang fzwischen dem mitteleren und hohen Frequenzgang höher als der Standardwert wird, wie durch die feste Linie in Fig. 35, angezeigt, die Vormagnetisierungsstrom-Abstimmung durchführen. 2. Wenn er niedriger wird, wie durch die gestrichelte Linie angezeigt, die Vormagnetisierungsstrom-Abstimmung durchführen. **Anm.:** Für die Messung des Vormagnetisierungsstromes sel auf den Abschnitt "Vormagnetisierung" hingewiesen.
(K) Fluorezenzmeter Bedingung: * Aufnahme * Eingangsregler...Max. * Bandwahl Schalter ...Normal position Meßogerät: * Röhrenvoltmeter * NF-Generator * Abschwächer * Widerstand (600Ω)	1. Den Meßaufbau zeigt Fig. 32. 2. Wie aus Fig. 36, ersichtlich, hört der astabile, aus den Transistoren Q402 und Q403 bestehende Multivibrator zu schwingen auf, wenn der Base des Q402 mit Masse verbunden wird. 3. Signal vor 1kHz (−24dB) an die Line IN-Buchse eingeben und die Aufnahmetaste drücken. 4. ATT so abstimmen, daß der Ausgangspegel an der LINE OUT-Buchse 0,39V wird. (Der Eingangspegel in dieser Stellung wird als Standardpegel bezeichnet). 5. Justierung auf "−20dB". A. Den Abschwächer so einstellen, daß der Eingangspegel −20dB des Stand-Aufnahmepegels beträge. B. VR401 so abgleichen, daß im Bereich von −20dB±0,8dB das Segment −20dB aufleuchtet (NUR LINKER KANAL). (S. Fig. 37). 6. Justierung auf "0dB". A. ATT so abstimmen, daß der Ausgangspegel an der LINE OUT-Buchse, 0,39V wird. B. VR402 so abgleichen, daß im Bereich von ±0,2dB um den Standardpegel das Segment +1dB aufleuchtet (S. Fig. 38). 7. Die Anleitungsschritte 5 bis 6 zweimal wiederholen. 8. Die ATT einstellen; kontrollieren, ob alle Segmente aufleuchten, wenn der Eingangspegel 10dB hörher als der Standardpegel ist (S. Fig. 39).
(L) Dolby-Schaltung Bedingung: * Aufnahme * Eingangsregler...Max. * Dolby-Schalter ...OUT/IN Meßgerät: * Röhrenvoltmeter * NF-Generator * Abschwächer * Oszillograf * Widerstand (600Ω)	1. Die Verrindungen des Prüfaubaus sind in Fig. 40 wiedergegeben. 2. Gerät in Stellung "Aufnahme" betreiben und Dolby-Schalter ausschalten. Dem NF-Eingang ein 5kHz-Signal zuführen, daß and TP11 (Linker Kanal) und TP12 (Rechter Kanal) −34,5dB erhalten werden. 3. Prüfen, ob das Signal bei eingeschaltetem Dolby-Schalter um 8 (±2,5)dB größer ist als bei ausgeschaltetem Dolby-Schalter.